frontiers | Research Topics

Therapeutic process and treatment evaluation in forensic psychiatry and prison

Edited by
Manuela Dudeck, Najat R. Khalifa, Jürgen Leo Müller, Birgit Angela Völlm and Judith Streb

Published in
Frontiers in Psychiatry

ISSN 1664-8714
ISBN 978-2-83251-006-3
DOI 10.3389/978-2-83251-006-3

About Frontiers

Frontiers is more than just an open access publisher of scholarly articles: it is a pioneering approach to the world of academia, radically improving the way scholarly research is managed. The grand vision of Frontiers is a world where all people have an equal opportunity to seek, share and generate knowledge. Frontiers provides immediate and permanent online open access to all its publications, but this alone is not enough to realize our grand goals.

Frontiers journal series

The Frontiers journal series is a multi-tier and interdisciplinary set of open-access, online journals, promising a paradigm shift from the current review, selection and dissemination processes in academic publishing. All Frontiers journals are driven by researchers for researchers; therefore, they constitute a service to the scholarly community. At the same time, the *Frontiers journal series* operates on a revolutionary invention, the tiered publishing system, initially addressing specific communities of scholars, and gradually climbing up to broader public understanding, thus serving the interests of the lay society, too.

Dedication to quality

Each Frontiers article is a landmark of the highest quality, thanks to genuinely collaborative interactions between authors and review editors, who include some of the world's best academicians. Research must be certified by peers before entering a stream of knowledge that may eventually reach the public - and shape society; therefore, Frontiers only applies the most rigorous and unbiased reviews. Frontiers revolutionizes research publishing by freely delivering the most outstanding research, evaluated with no bias from both the academic and social point of view. By applying the most advanced information technologies, Frontiers is catapulting scholarly publishing into a new generation.

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the *Frontiers journals series*: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area.

Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers editorial office: frontiersin.org/about/contact

Therapeutic process and treatment evaluation in forensic psychiatry and prison

Topic editors

Manuela Dudeck — Klinik für Forensische Psychiatrie und Psychotherapie, Universitaetsklinikum Ulm, Germany

Najat R. Khalifa — Queen's University, Canada

Jürgen Leo Müller — Independent researcher

Birgit Angela Völlm — University of Rostock, Germany

Judith Streb — Klinik für Forensische Psychiatrie und Psychotherapie, Universitaetsklinikum Ulm, Germany

Citation

Dudeck, M., Khalifa, N. R., Müller, J. L., Völlm, B. A., Streb, J., eds. (2022). *Therapeutic process and treatment evaluation in forensic psychiatry and prison*. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-83251-006-3

Table of contents

frontiers | Frontiers in Psychiatry

TYPE Editorial
PUBLISHED 25 November 2022
DOI 10.3389/fpsyt.2022.1095592

OPEN ACCESS

EDITED AND REVIEWED BY
Thomas Nilsson,
University of Gothenburg, Sweden

*CORRESPONDENCE
Manuela Dudeck
manuela.dudeck@bkh-guenzburg.de

SPECIALTY SECTION
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

RECEIVED 11 November 2022
ACCEPTED 15 November 2022
PUBLISHED 25 November 2022

CITATION
Dudeck M, Müller JL, Völlm B, Khalifa NR and Streb J (2022) Editorial: Therapeutic process and treatment evaluation in forensic psychiatry and prison. *Front. Psychiatry* 13:1095592. doi: 10.3389/fpsyt.2022.1095592

Editorial: Therapeutic process and treatment evaluation in forensic psychiatry and prison

Manuela Dudeck[1]*, Jürgen Leo Müller[2], Birgit Völlm[3], Najat R. Khalifa[4] and Judith Streb[1]

[1]Department of Forensic Psychiatry and Psychotherapy, Ulm University, Ulm, Germany, [2]Clinic for Psychiatry and Psychotherapy – Forensic Psychiatry, Human Medical Center Göttingen, Georg-August-University Göttingen, Göttingen, Germany, [3]Department of Forensic Psychiatry, University Medicine Rostock, Rostock, Germany, [4]Department of Psychiatry, Queen's University, Kingston, ON, Canada

KEYWORDS

forensic psychiatry, prison, risk assessment, recidivism, treatment effectiveness, offender treatment programmes

Editorial on the Research Topic
Therapeutic process and treatment evaluation in forensic psychiatry and prison

In forensic psychiatry and correctional settings, treatment approaches have two broad goals: to prevent crime and, when applicable, to treat an underlying mental illness. In the context of crime prevention, forensic rehabilitation models, such as the Risk-Need-Responsivity (RNR) Model (1), have been devised to reduce re-offending rates. In programmes based on RNR risk factors are identified and coping strategies are practiced. Studies show that programmes operating according to these principles lead to a significant reduction in recidivism (2). In addition, standardized professional risk assessment tools have been developed and their use has become increasingly important. These instruments can be used to inform decisions about different situations. For example, the decision whether someone should be placed in a forensic psychiatry hospital or prison setting is based on the general likelihood of recidivism, so the probability of an adverse incident occurring during detention needs to be predicted. On the other hand, to justify discharge from a forensic psychiatric institution or release from prison according to § 66 of the German Criminal Code, the necessary conditions for preventing recidivism have to be anticipated. The questions to be answered in these assessments not only have a different focus but also apply to different time periods, and different predictors are of relevance depending on the time of the assessment. The assessment of long-term risk considers actuarial and dynamic risk variables [e.g., Historical Clinical Risk Management-20, Version 3, HCR-20 v3; (3)]. In contrast, the assessment of short-term risk focuses on variables that can become a significant indicator of risk for the person being assessed if they occur repeatedly, in the sense of a crisis-like escalation; the importance of such variables should not be overlooked [e.g., Short-Term Assessment of Risk and Treatability, START; (4)]. Although a number of well-studied instruments

are available for prognosis after release or discharge, there is a relative dearth of empirical data on the quality of predictors for short-term prognosis and continuous risk assessments. The START method (4) captures dynamic variables that are scored as either risk factors or protective factors, depending on whether they are present and their degree of expression. START is a clinical guide for risk domains related to negative behaviors, such as violence to others, suicide, self-harm, self-neglect, unauthorized absence (e.g., failure to return from a day pass), substance use, risk of being victimized and general offending.

In this volume, two papers present studies that tested the applicability of START. Driven by the awareness that the risk of violence and other undesirable behaviors are of a major concern in forensic psychiatric facilities, Hvidhjelm et al. studied the utility of START in preventing these critical events in forensic units in Denmark. They studied time periods in which they used START in patients and compared it to control periods in which START was not used. Comparing the rate of mechanical restraints within and outside START periods, they found that the rate of mechanical restraint use within the START period was significantly lower (82%). Hvidhjelm et al. identified benefits and outcomes of the implementation of START, particularly in relation to the use of mechanical restraint in a forensic setting. With regard to cultural differences in the predictive accuracy of assessment tools, Kikuchi et al. investigated the benefit of the START in the Japanese Forensic Probation Service. They found that START was able to predict physical violence and unauthorized leave as well as self-neglect. Their results allow to recommend the START for treatment planning and promotion of recovery in the Japanese Forensic Probation Service.

Severe mental disorders are highly prevalent among patients in forensic psychiatric and prison settings. The approximate prevalence rates of severe mental disorders amongst prison inmates are as follows: psychotic illnesses, 4%; major depression, 10%; and personality disorders, 50% (5), alcohol use disorder, 24%; drug use disorder, 30% (6). It is imperative that these individuals are offered evidence-based therapies, and extensive guidelines from the respective professional societies are available for the most common disorders. There is a broad consensus among researchers and clinicians that patient and treatment programme characteristics should be matched to optimize treatment outcomes. However, no consensus exists on the question of which specific factors should be considered. The following studies focus on internal (e.g., characteristics of the patient) and external factors (e.g., characteristics of the therapy and treatment setting) that may hinder or enhance the therapeutic process.

So far, research on psychopharmacological treatments for forensic patients with schizophrenia has mainly focused on men. However, many countries have seen an increase in the number of women hospitalized in forensic psychiatry settings, underlining the need for evidence-based research on sex-specific treatment strategies for female forensic patients (7). Mayer et al. surveyed psychopharmacological treatment strategies, psychopathological characteristics and neurological and metabolic adverse effects of treatment in 29 male and 29 female forensic-psychiatric patients. They found that, compared to men, women had more severe mental disorders and were more frequently treated with second-generation depot antipsychotics. However, the researchers found no differences between the sexes in the efficacy of the dosages.

Although opioid agonist treatment (OAT) is the first line recommended treatment for opioid use disorders in the relevant guidelines, in contravention of the principle of equivalence, this treatment is often not available to prisoners or patients in forensic-psychiatric care. Reiners et al. surveyed all forensic-psychiatric hospitals offering treatment for patients with substance use disorders in Germany and found that only under half offered such interventions. Critical incidents, such as violence or absconding, did not differ between clinics that did and did not offer OAT. Maybe somewhat surprising, early termination of treatment (or treatment dropout) was higher in clinics with OAT. A high proportion of terminations were due to rule violations such as giving the OAT away. Other reasons included additional drug use and refusal to give a urine drug sample. It is possible that those who received OAT represented a patient group with more complex needs and hence achieved less favorable outcomes. More research is clearly needed in order to understand OAT practice and risks.

Conducting studies on the efficacy of specific therapeutic approaches to reduce recidivism rates is challenging, not least because of the difficulties inherent in empirically demonstrating the superiority of any particular treatment approach over usual care. Lardén et al. used a randomized controlled design to evaluate the effectiveness of an individual Cognitive-Behavioral Intervention (iCBT) for serious young male violent offenders in comparison to treatment-as-usual (TAU). After 24 months, the violent reconviction rate was slightly higher for iCBT+TAU vs. TAU-only group. The authors emphasized that these differences were not significant, nevertheless they did not find an additive effect of individual CBT beyond group-based TAU. They discussed the impact of sample size and substantial treatment dropouts on outcomes.

Sociotherapeutic treatment comprises psychotherapeutic, educational, vocational and recreational measures in the context of a milieu-therapeutic setting. In Germany, sociotherapeutic treatment is offered in special facilities within the prison system. Hausam et al. evaluated post-release recidivism in a group of male young offenders aged 14–22 years, having undergone treatment in a social-therapeutic unit to a group matched for offending not having been through this treatment. They found no main effect on recidivism. Additional analyses showed a significant effect of vocational training and education, but not individual psychology sessions on reoffending. These results have important implication for designing treatment programmes for juveniles.

About a quarter of all prison inmates have attention deficit hyperactivity disorder (ADHD). To better support these patients in the prison system, Buadze et al. surveyed 19 staff members of a correctional facility in Switzerland and evaluated their responses by content analysis. The results suggest that inmates with ADHD are perceived as being difficult and are also more likely to be subjected to disciplinary sanctions. The authors recommend providing training to staff so that ADHD can be diagnosed early and treated adequately (including by therapy and with drugs).

Psychological distress is common among prison inmates. The study by Sfendla et al. examined whether inmates' psychological distress was reduced when they participated in a weekly 90-min yoga class. A control group participated in free-choice physical exercise at the same time. Before and after the 10-week intervention, participants completed the Brief Symptom Inventory. Results showed that physical activity (including yoga) reduced levels of psychological distress but that the positive effect of yoga was even stronger than that of free-choice physical exercise with respect to symptoms of compulsion, paranoid ideation and somatization.

The physical environment has been described as one of the central determinants of mental health and wellbeing (8) and researchers of different disciplines have stressed the importance of a comprehensive understanding of the concepts of space and place for mental health and care (9). Ross et al. reviewed the literature on the relationship between the physical environment and wellbeing in prisons and secure forensic mental health settings. In addition, they report on theoretical models and findings from non-forensic mental health settings. Their findings highlight the link between overcrowding and aggression, as well as other measures of mental health and wellbeing. They also highlight the impact of architecture and designs of these institutions on these measures. The findings of this study signify the importance of achieving the right balance between security, therapy and rehabilitation in custodial and secure hospital settings.

To reduce recidivism, close networking and cooperation is necessary between patients/prison inmates, their families, facility staff, the courts and services providing aftercare to forensic psychiatric patients. This approach requires transparency and a good exchange of information between stakeholders. The last two studies in this volume focus on the care structure for mentally ill people. Askola et al. analyzed the need and development possibilities of forensic psychiatry in Finland. For this purpose, they interviewed forensic psychiatric patients and their parents, as well as service providers, and evaluated the responses by content analysis. Respondents called for increased risk awareness and risk assessment skills at the general psychiatric level, increased therapeutic engagement throughout the rehabilitative process and structured post-discharge aftercare. In 2019, the first psychiatric day hospital (PDC) was established in Switzerland to improve mental health care for pretrial detainees. Using a cross-sectional observational study design, Gerth et al. aimed to evaluate the need for mental health care in pretrial detention and the potential of the PDC in order to improve it. The findings revealed a significant reduction in psychiatric hospital admission rates (18.5 %) for pretrial detainees who were treated in the PDC. This group of detainees significantly differed from other prisoners in relation to mental disorder, gender and alleged index offense. More specifically, they were more likely than other groups to have adjustments disorders and less likely to have schizophrenia spectrum disorders. Collectively, the findings signify the role of innovative intervention like PDC in improving mental health outcomes for pretrial detainees.

Author contributions

MD, NK, JM, BV, and JS wrote parts of the manuscript. JS combined the contributions and formulated the transitions. All authors read and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Andrews DA, Bonta J. *The psychology of criminal conduct*. Newark: Anderson. (2006).

2. Bonta J, Blais J, Wilson HA. A theoretically informed meta-analysis of the risk for general and violent recidivism for mentally disordered offenders. *Aggress Violent Behav.* (2014) 19:278–287. doi: 10.1016/j.avb.2014.04.014

3. Douglas KS, Hart SD, Webster CD, Belfrage H. *HCR-20 V3: Assessing risk for violence – User guide*. Burnaby, Canada:

Mental Health, Law, and Policy Institute, Simon Fraser University. (2013).

4. Webster C, Martin M, Brink J, Nicholls T, Desmarais S. *Manual for the Short-term Assessment of Risk and Treatability (START). 1.1 Version*. Coquitlam: British Columbia Mental Health and Addiction Services. (2009).

5. Fazel S, Danesh J. Serious mental disorder in 23000 prisoners: a systematic review of 62 surveys. *Lancet.* (2002) 359:545–50. doi: 10.1016/S0140-6736(02)07740-1

6. Fazel S, Yoon IA, Hayes AJ. Substance use disorders in prisoners: an updated systematic review and meta-regression analysis in recently incarcerated men and women. *Addiction.* (2017) 112:1725–39. doi: 10.1111/add.13877

7. de Vogel V, Nicholls TL. Gender matters: an introduction to the special issues on women and girls. *Int J Forens Ment Health.* (2016) 15:1–25. doi: 10.1080/14999013.2016.1141439

8. Clark C, Myron R, Stansfeld S, Candy B. A systematic review of the evidence on the effect of the built and physical environment on mental health. *J Public Ment Health.* (2007) 6:14–27. doi: 10.1108/17465729200700011

9. Roxberg Å, Tryselius K, Gren M, Lindahl B, Werkander Harstäde C, Silverglow A, et al. Space and place for health and care. *Int J Qual Stud Health Well Being.* (2020) 15:1750263. doi: 10.1080/17482631.2020.1750263

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 03 September 2018
doi: 10.3389/fpsyt.2018.00407

Yoga Practice Reduces the Psychological Distress Levels of Prison Inmates

*Anis Sfendla[1], Petter Malmström[2], Sara Torstensson[2] and Nóra Kerekes[2]**

[1] Department of Biology, Faculty of Sciences, Abdelmalek Essaâdi University, Tetouan, Morocco, [2] Department of Health Sciences, University West, Trollhättan, Sweden

Background: Psychiatric ill-health is prevalent among prison inmates and often hampers their rehabilitation. Rehabilitation is crucial for reducing recidivistic offending. A few studies have presented evidence of the positive effect of yoga on the well-being of prison inmates. The conclusion of those previous studies that yoga is an effective method in the rehabilitation process of inmates, and deserves and requires further attention.

Aims: The current study aimed to evaluate the effect of 10 weeks of yoga practice on the mental health profile, operationalized in the form of psychological distress, of inmates.

Methods: One hundred and fifty-two volunteer participants (133 men; 19 women) were randomly placed in either of two groups: to participate in weekly 90-min yoga class (yoga group) or a weekly 90-min free-choice physical exercise (control group). The study period lasted for 10 weeks. Prior to and at the end of the study period the participants completed a battery of self-reported inventories, including the Brief Symptom Inventory (BSI).

Results: Physical activity (including yoga) significantly reduced the inmates' levels of psychological distress. Yoga practice improved all primary symptom dimensions and its positive effect on the obsessive-compulsive, paranoid ideation, and somatization symptom dimensions of the BSI stayed significant even when comparing with the control group.

Conclusions: Yoga as a form of physical activity is effective for reducing psychological distress levels in prison inmates, with specific effect on symptoms such as suspicious and fearful thoughts about losing autonomy, memory problems, difficulty in making decisions, trouble concentrating, obsessive thought, and perception of bodily dysfunction.

Keywords: mental health, psychological distress, prison inmates, RCT, yoga

OPEN ACCESS

Edited by:
Athanassios Douzenis, National and Kapodistrian University of Athens Medical School, Greece

Reviewed by:
Marie-Louise Psarra, University General Hospital Attikon, Greece
Vicky Yotsidi, University General Hospital Attikon, Greece

****Correspondence:***
Nóra Kerekes
nora.kerekes@hv.se

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: *08 June 2018*
Accepted: *10 August 2018*
Published: *03 September 2018*

Citation:
Sfendla A, Malmström P, Torstensson S and Kerekes N (2018) Yoga Practice Reduces the Psychological Distress Levels of Prison Inmates. Front. Psychiatry 9:407. doi: 10.3389/fpsyt.2018.00407

INTRODUCTION

Originally, prisons were established to isolate convicted offenders in order to keep society safe. The major tasks of these institutions included punishment and correction of individuals who often had a history of aggression and/or antisocial behavior (1). Over time, the purpose of correctional institutions changed; it shifted from isolation and punishment to prevention of relapse into criminality by using different treatment programs. As psychiatric ill-health is a common condition among prison inmates (2, 3), today's correctional institutions pay greater attention to the issue of inmates' mental health as a factor determining the risk of relapse. It has been estimated

that prisons hold more than three times as many persons with psychiatric problems and/or diagnoses than can be found in psychiatric facilities (4). Personality and mood disorders, addiction, and neurodevelopmental syndromes are the most frequent mental health problems occurring in prison inmates (5, 6). Psychopathic personality profile (7), substance abuse and attention deficit hyperactivity disorder are the most recurring diagnoses when considering the risk of relapse into a criminal life style (8).

The Swedish Prison and Probation Service aims to enhance inmates' opportunities to reintegrate into society upon release and their ability to live a drug free and law-abiding life. To this end, the Prison and Probation Service requires all inmates to participate in rehabilitation activities, 6 h a day, 5 days a week. As the capabilities and needs of inmates differ greatly, there is a wide range of activities to choose from. Beside occupational activities, inmates are provided opportunities to participate in study programs, rehabilitation programs concerning drug- and alcohol abuse, violent behavior and aggression, yoga classes, health programs, drama, painting and writing classes, etc (9).

The Prison and Probation Service has offered yoga classes to inmates since 2008 [for details on the "Krimyoga" offered, please see Kerekes et al. (10)]. Yoga aims to reconstruct the balance between body and mind by using physical, psychological, and spiritual practices. The core of yoga is conscious, deep and slow breathing during which different body movements are performed, while shifting one's focus to the body in still positions (body awareness) and to one's feelings at the moment. In some yoga forms, the session ends with meditation. The physiological and psychological impacts of yoga have been tested in various samples: general population, clinical settings, and prison inmates (11–13). It has been shown that regular exercises of yoga reduce physiological response to stress (14), state and trait anxiety and depression (15), antisocial behaviors (10), as well as anger and aggression (16). Furthermore, regular yoga practice is coupled with increased positive and decreased negative emotional states (10, 17), decreased stress (17), as well as with significantly improved impulse control and sustained attention (10). Importantly, it has been shown that yoga in correctional settings has a positive effect on risk factors associated with criminal recidivism (10).

Beside the important psychological benefits, yoga practitioners experience physiological benefits, such as improved body posture and breathing technique, increased body awareness and easier relaxation (18). In terms of biological benefits, regular yoga exercise has been found to favor normalized activity of the hypothalamus, pituitary-, and adrenal glands, and the autonomic nervous system (19), to decrease the concentration of cortisol, and to increase the concentration of serotonin and melatonin (18). As yoga can be practiced in group settings, it can also have positive effects in terms of social relations and feelings of belonging among those practicing yoga together (20).

Although the effects of yoga have already been studied, only a few studies have been conducted among prison inmates. The aim of this study is to investigate the effect of 10 weeks of yoga practice on the participating prison inmates' mental health profile, operationalized in the form of psychological distress levels.

SUBJECTS AND METHODS

Procedure and Sample

The present study is part of a broader research, therefore for a detailed description of the study procedure and methods, please refer to Kerekes et al. (10). In short, they were as follows: During a 20-month period in 2013, 2014, and 2015, male and female inmates from several high- and medium-security class prisons participated in the study. After giving their consent to participate, the inmates were randomly placed in either of two groups: a group participating once a week for 10 weeks in a 90-min long yoga class (the yoga group); a group participating once a week for 10 weeks in a 90-min long free-choice non-yoga physical exercise (the control group). Prior to the start (Time 1) of the 10-week study period and again upon its completion (Time 2), the participants completed a survey, comprising several self-reported measures (assessing stress, aggression, affective states, sleep-quality, and psychological well-being). One of these measures was the Brief Symptom Inventory, which assesses a person's level of psychological distress.

A total sample of 226 inmates (201 men; 25 women) participated in the study. The average attrition rate was 32.7%. For detailed description of attrition rates and reasons in the yoga and control groups, please see Kerekes et al. (10). The final number of participants completing the whole study period was 152 (133 men; 19 women). The participants were evenly distributed between the yoga group and the control group [yoga group: 77 (67 male and 10 female) with a mean age of 36.4 years; control group: 75 (66 male and 9 female) with a mean age of 34.9 years]. A detailed description of the participants' characteristics, including comparison between the yoga and the control groups was previously published in Kerekes et al. (10), where participants in the yoga and control groups were comparable in gender distribution, age, length of sentence, and security level of holding prison.

Instrument—The Brief Symptom Inventory

The Brief Symptom Inventory (BSI) is a self-reported measure of psychological distress and psychiatric symptoms (21). The inventory consists of 53 items, assessing 9 primary symptom dimensions (see details below), and the Global Severity Index (GSI), which measures the individual's overall psychological distress level. Participants are asked to rate how much a problem has bothered or distressed them over the previous month. Items can be rated on a five-point Likert scale from 0 to 4 (0 = not at all, 1 = a little, 2 = moderately, 3 = substantially, and 4 = extremely). Higher scores therefore indicate greater psychological distress, whereas lower scores indicate better psychological well-being and/or psychiatric health. The 9 primary symptom dimensions are as follows:

1. Anxiety: Indications of tension, restlessness, and nervousness, as well as experiences of free-floating anxiety or panic. The following items defined the Anxiety scale in the present study:

"Nervousness or shakiness inside," "suddenly scared for no reason," "feeling fearful," "feeling tense or keyed up," "spells of terror or panic," "feeling so restless you could not sit still."

2. Depression: A wide range of symptoms and signs from dysphoric affect and mood, loss of energy and interest in life activities to feelings of hopelessness and uselessness. The following items defined the Depression scale in the present study:

"Thoughts of ending your life," "feeling lonely," "feeling blue," "feeling no interest in things," "feeling hopeless about the future," "feelings of worthlessness."

3. Interpersonal Sensitivity: Feelings of inadequacy and inferiority and signs of uneasiness and discomfort during interpersonal interactions. The following items defined the Interpersonal Sensitivity scale in the present study:

"Your feelings are easily hurt," "feelings that people are unfriendly or dislike you," "feeling inferior to others," "feeling very self-conscious with others."

4. Hostility: Feelings of irritability and annoyance, the presence of frequent arguments and urges to break things. The following items defined the Hostility scale in the present study:

"Feeling easily annoyed or irritated," "temper outbursts that you cannot control," "having urges to beat, injure, or harm someone," "having urges to break or smash things," "getting into frequent arguments."

5. Obsessive-Compulsive: Thoughts and actions that are experienced as irresistible and persistent. The following items defined the Obsessive-Compulsive scale in the present study:

"Trouble remembering things," "feeling blocked in getting things done," "having to check and double check what you do," "difficulty in making decisions," "your mind going blank," "trouble concentrating."

6. Psychoticism: Psychoticism is described as a continuum pending between a mildly alien life style and extremely psychotic status. Outside the psychiatric population, this dimension can measure social alienation. The following items defined the Psychoticism scale in the present study:

"The idea that someone else can control your thoughts," "feeling lonely even when you are with people," "never feeling close to another person," "the idea that something is wrong with your mind."

7. Paranoid Ideation: Suspicious, hostile, and fearful thoughts of losing autonomy. The following items defined the Paranoid Ideation scale in the present study:

"Feeling that others are to blame for most of your troubles," "feeling that most people cannot be trusted," "feeling that you are watched or talked about by others," "others not giving you proper credit for your achievements," "feeling that people would take advantage of you if you let them."

8. Phobic Anxiety: Phobias such as fear of crowds, open spaces, conveyances, etc. The following items defined the Phobic Anxiety scale in the present study:

"Feeling afraid in open spaces," "feeling afraid to travel on buses, subways, or trains," "having to avoid certain things, places or activities because they frighten you," "feeling uneasy in crowds," "feeling nervous when you are left alone."

9. Somatization: The perception of bodily dysfunction. Aches, pains, and other discomforts stemming from the musculature or complaints coupled to the cardiovascular, gastrointestinal, and respiratory systems. The following items defined the Somatization scale in the present study:

"Faintness or dizziness," "pains in heart or chest," "nausea or upset stomach," "trouble getting your breath," "numbness or tingling in parts of your body," "feeling weak in parts of your body," "feeling heavy in arms or legs."

Yoga Classes and Free-Choice Physical Exercise

The yoga classes were led by prison officers who had received training in yoga instruction provided by the Swedish Prison and Probation Service. The yoga classes ("Krimyoga") were based on *hatha yoga*, a form of physical yoga that includes elements of relaxation specifically developed for use in correctional settings. Each yoga class comprised (in sequence) at least 10 min of warm up, a defined combination of *asanas* (yoga postures), about 5 min of breathing exercises, and finally 5 min of relaxation and deep relaxation. The weekly yoga classes lasted for 90 min and were carried out uniformly across the different correctional facilities.

Free-choice physical exercise could typically include training in gym, walking, basketball, or football. Post-intervention assessment in our study included a question on time spent on physical activity and ensured that each participant (of the control group) indeed has spent at least 90 min every week with physical activity.

Data Analysis

As the low number of female participants in the study (19 of 152) did not allow gender-specific analyses, male and female subjects' data were analyzed together in this study. Violation of normality assumption was revealed by Shapiro–Wilk test in the assessed BSI data. Non-parametric tests were therefore performed. Wilcoxon Signed Rank test was used to assess changes in BSI scores from Time 1 (beginning of the 10-week study period) to Time 2 (end of the study period) within each group (yoga and control) and Mann-Whitney *U*-test was conducted to compare differences between the groups. The effect size was calculated by dividing the z value by the square root of N (total number of cases). Cohen (22) criteria of 0.1 = small effect, 0.3 = medium effect, 0.5 = large effect were applied for the results interpretation. Significance

level was defined at $p < 0.05$. The data was processed with the help of the statistical program SPSS version 23 (IBM).

Ethics

The regional Ethical Review Board in Linköping approved the study (Dnr 2013/302 – 31). The prison inmates received complete information (written and oral) about the study and the conditions of participation. Participation was entirely voluntary and all participants were ensured that their answers would in no way affect their actual prison sentence to be served. Participation required the signature of a written consent form. The collected information was treated confidentially and the researchers received only coded data. Participants who completed the whole study received a compensation of 200 Swedish crowns (about 20 euros/US dollars).

RESULTS

The data analysis revealed significant changes in all but three primary symptom dimensions (obsessive-compulsive, somatization, and phobic anxiety) in the control group. These significant changes were improvements with small effect sizes (r varied between 0.15 and 0.29) (**Table 1**). In the yoga group all dimensions of psychological distress were significantly improved with small or medium effect size (r varied between 0.19 and 0.36) (**Table 1**). While the Global Severity index decreased in both groups with a similar, medium effect size, the effect size of the measured improvements in each primary dimension was always bigger within the yoga group. **Table 1** summarizes the results of the within-group analyses on the General Severity Index (GSI) and the 9 primary symptom dimensions of the BSI in the control and the yoga groups separately.

Between-group analyses revealed highly significant changes in three primary BSI symptom dimensions: obsessive-compulsive, paranoid ideation, and somatization. A significantly lower mean was reported for the score on the obsessive-compulsive dimension by the yoga group (mean rank = 62.72, $n = 71$) compared to the control group (mean rank = 82.01, $n = 73$), ($z = -2.79$, $p = 0.005$, $r = 0.23$). A significantly lower mean rank difference was also reported for the score on the paranoid ideation dimension by the yoga group (mean rank = 65.02, $n = 71$) compared to the control group (mean rank = 80.66, $n = 74$), ($z = -2.25$, $p = 0.024$, $r = 0.18$), and similarly for the primary dimension of somatization by the yoga group (mean rank = 64.46, $n = 71$) compared to the control group (mean rank = 80.32, $n = 73$), ($z = -2.29$, $p = 0.022$, $r = 0.19$). All of these differences had a small effect size. **Table 2** summarizes the results of the between-group analyses on the General Severity Index (GSI) and the 9 primary symptom dimensions of the BSI.

DISCUSSION

The present study provides further evidence that physical activity generally reduces psychological distress and psychiatric complaints in prison inmate samples. The main finding of the present study is that yoga practice has specific positive effects on the mental ill-health of prison inmates, offering significant help

TABLE 1 | Changes within groups (yoga and control) measured with z-scores, means (M), and standard deviations (SD) on the global severity index and on the primary symptom dimensions at pre- and post-intervention assessment in both groups.

	Within groups											
	Control group ($n = 75$)						Yoga group ($n = 77$)					
Psychological distress BSI	Time 1 M(SD)	Time 2 M(SD)	Average change	p_{within}	z	r	Time 1 M(SD)	Time 2 M(SD)	Average change	p_{within}	z	r
Global severity index	1 (0.7)	0.8 (0.7)	−0.2 (0.4)	<0.001	−3.7	0.30	0.8 (0.5)	0.6 (0.6)	−0.3 (0.5)	<0.001	−3.8	0.30
Anxiety	1.2 (0.9)	0.9 (0.9)	−0.3 (0.7)	<0.001	−3.62	0.29	1.1 (0.8)	0.8 (0.8)	−0.4 (0.6)	<0.001	−4.69	0.33
Depression	1.2 (0.9)	1.0 (1.0)	−0.2 (0.8)	0.016	−2.41	0.19	1 (0.8)	0.7 (0.7)	−0.4 (0.7)	<0.001	−4.68	0.33
Interpersonal Sensitivity	0.9 (0.9)	0.8 (1.0)	−0.1 (0.7)	0.046	−2	0.15	0.8 (0.8)	0.4 (0.6)	−0.3 (0.7)	<0.001	−4.05	0.29
Hostility	0.9 (0.8)	0.7 (0.7)	−0.2 (0.8)	0.019	−2.34	0.18	0.8 (0.7)	0.5 (0.7)	−0.2 (0.6)	0.003	−3	0.21
Obsessive-compulsive	1.3 (0.9)	1.2 (0.9)	−0.2 (0.7)	0.057	−1.9	0.15	1.3 (0.9)	0.8 (0.7)	−0.4 (0.6)	<0.001	−5.03	0.36
Psychoticism	0.9 (0.8)	0.7 (0.8)	−0.2 (0.6)	0.012	−2.5	0.20	0.7 (0.8)	0.5 (0.7)	−0.2 (0.7)	0.003	−2.95	0.21
Paranoid ideation	1.3 (0.9)	1 (0.9)	−0.2 (0.6)	0.005	−2.83	0.22	1.1 (0.9)	0.7 (0.7)	−0.5 (0.7)	<0.001	−4.6	0.33
Phobic anxiety	0.6 (0.9)	0.5 (0.9)	−0.1 (0.7)	0.217	−1.23	0.09	0.6 (0.8)	0.3 (0.7)	−0.2 (0.6)	0.007	−2.7	0.19
Somatization	0.7 (0.6)	0.7 (0.6)	−0.1 (0.6)	0.114	−1.58	0.12	0.6 (0.6)	0.4 (0.6)	−0.3 (0.5)	<0.001	−4.16	0.30

TABLE 2 | Between–group comparison on the global severity index and the primary symptom dimensions of BSI (*n* varies between 76 and 64 for the control group and between 77 and 50 for the yoga group in the different dimensions).

Psychological distress BSI	Mean Rank		$p_{between}$	*z*	*r*
	Control group	Yoga group			
Global severity index	61.28	52.66	0.17	−1.38	0.12
Anxiety	76.69	68.19	0.219	−1.23	0.10
Depression	78.91	67.63	0.105	−1.62	0.13
Interpersonal sensitivity	81.55	68.18	0.055	−1.92	0.16
Hostility	77.68	74.38	0.64	−0.47	0.04
Obsessive-compulsive	82.01	62.72	0.005	−2.79	0.23
Psychoticism	75.81	72.11	0.593	−0.53	0.04
Paranoid ideation	80.66	65.02	0.024	−2.25	0.18
Phobic anxiety	77.94	69.18	0.191	−1.31	0.11
Somatization	80.32	64.46	0.022	−2.29	0.19

with symptoms of paranoid ideation, memory problems, trouble concentrating, obsessive thought, and somatization.

In this study, inmates were randomized into either a group where they could participate in a weekly yoga exercise or into a group where they could practice free-choice non-yoga physical activity, both during a 10-week period. Both groups of inmates reported significantly improved psychological distress levels, mostly in terms of decreased levels of anxiety, depressive symptoms, interpersonal sensitivity, suspiciousness, hostility, fearful thoughts, and social alienation.

General Effects of Physical Activity (Including Yoga) on the Level of Psychological Distress And/Or Psychiatric Complaints

This study revealed a significantly decreased level of anxiety and depressive symptoms in both groups. The negative association between physical activity and prevalence of depression and anxiety disorders has been repeatedly described in previous research and repeated now with our study. A few studies even examined the association between physical activity and these complaints in a prospective design. A review of these prospective studies suggests that physical activity may be clinically effective, at least in major depression and panic disorder (23). Moreover, cardiovascular and resistance training and high-intensity strength training have been found to significantly reduce depression scale scores after a 9-month testing period (24), cardiovascular and resistance training has showed significantly improved numbers in interpersonal sensitivity, and high-intensity strength training has showed improved numbers in anxiety, phobic anxiety, and hostility (24). This study supports that these measures (interpersonal sensitivity, phobic anxiety, and hostility) also significantly improve after 10 weeks of yoga exercises. Consistent with previous findings, this study also shows that yoga can be used advantageously against depression and anxiety (25, 26).

Previous research found that yoga, as a complement to drug treatment, is suitable for patients diagnosed with schizophrenia and helps patients with psychoticism or paranoid ideation to regain better quality of life and socio-professional function (26, 27). In this study, we found that these dimensions of psychological distress were significantly improved not only by yoga, but also by regular non-yoga free-choice physical activity.

Specific Effects of Yoga on Psychological Distress And/Or Psychiatric Complaints

In this study, we measured a significant decrease in paranoid symptoms—such as suspicious and fearful thoughts about others planning or willing to take one's autonomy—after 10 weeks of yoga classes when compared to the non-yoga control group. This is in line with previous findings from clinical studies where yoga therapy programs revealed significant improvement of both positive and negative psychotic symptoms in schizophrenia patients (28). This study is, however, the first to show a reduction of paranoid thoughts in prison inmates.

The other primary symptom dimension for which a significant difference was measured between the yoga group and the control group after the study period was the obsessive-compulsive symptom dimension. The effect of yoga particularly on obsessive-compulsive disorder was suggested in previous research (29). Furthermore, in a clinical population an increased effect of pharmaceutical treatment was observed when patients with obsessive-compulsive symptoms participated in yoga classes (30).

Yoga has a direct calming effect and can lead to an improved ability to control thoughts. Yoga may prevent or decrease thoughts from becoming obsessions and thus help the individual master his or her compulsive behavior (30). Positive results have been found for yoga practice as a complementary treatment for medication or psychotherapy for General Anxiety Disorder and Obsessive-Compulsive Disorder, including for imprisoned individuals (24). Moreover, significant improvements in concentration (31), sustained attention (10), and memory (32) have been measured after yoga practice.

This study also shown that yoga, but not non-yoga free-choice exercise, can significantly reduce symptoms of somatization. Yoga, in addition to its positive effects on mental conditions such as anxiety and depression, has also been found to have a positive effect on somatization symptoms (33), which is in accordance with our findings. Clinical symptoms of somatization include dizziness, headache, chest pain, nausea, difficulty breathing, feelings of body weakness, body numbness, and a heavy feeling in the body. Through the different variations of body postures the participants of yoga classes increase their body awareness, thus improving their sense of control over their own body (31), their perception of bodily dysfunction, and their ability to prevent psychosomatic symptoms (33).

The above discussed results of our study could be explained by underlining neurobiological changes. For example several studies have investigated the effects of yoga on the sympathetic and parasympathetic functions of the autonomic nervous system as

well as on the regulation of the hypothalamus-pituitary-adrenal axis (29, 34). These studies show that regular yoga exercise can reduce the levels of cortisol and catecholamines (adrenaline and noradrenaline) and increase the levels of serotonin, melatonin and gamma-amino butyric acid, which are all important factors in the regulation of mental health. Other physiological effects of yoga practice, in particular improved cortisol levels, can also be associated with improved self-esteem and mental and emotional states. These yoga-induced chemical changes in the body entail improved experiences of well-being and reduced levels of psychological distress (34).

Strengths and Limitations

The present study was a randomized controlled trial. This method is used to minimize the bias effects of extraneous or irrelevant variables on the measurements, and provides the strongest evidence of the effects of a treatment.

One limitation of the study is that the information about inmates' psychiatric health profile was operationalized and not assessed during a clinical examination. In addition, the use of self-reported measures is a limitation. Self-reported measures rely greatly on the respondent's capability to remember and admit the "truth"; answers may be distorted by social desirability and recall biases (35). However, self-reported research instruments present the significant advantages that they can be used without any clinical experience, are cost efficient, and can cover considerably larger numbers of individuals than when clinical measurements or semi-structured interviews are used for data collection in a given time frame. Furthermore, it has been found that in some cases it can be easier for respondents to report problems and complaints through an anonymous self-report, than during face-to-face clinical interview surveys or measures (35).

CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

This study confirms that physical activity has a positive effect on the psychological distress levels of prison inmates and provides new evidence about the specific positive effect of yoga on symptoms such as paranoid thoughts, memory problems, difficult decision making, trouble concentrating, obsessive thoughts, perception of bodily dysfunction, and somatization. The provision of opportunities for prison inmates to carry out physical activity in general and yoga exercise in particular can be an important tool for improving their reintegration into society and for helping them lead a drug free and law-abiding lifestyle upon release, which hypothesis should be tested in larger scale studies including follow-up recording of eventual long-term effects of the treatment.

AUTHOR CONTRIBUTIONS

AS was responsible for data analysis and interpretation, continuous progress monitoring, manuscript drafting and submission. PM and ST contributed to data analysis, interpretation, and manuscript drafting. NK designed and led the project and supervised the drafting and development of the manuscript.

FUNDING

This research was financed by the Swedish Prison and Probation Service with a project number 2012:251 and under the title: Psykobiologiska effekter av yoga i anstaltsmiljö.

ACKNOWLEDGMENTS

We thank the prison inmates for participating in this study and hope they have benefited from the experience. We wish to express our deep gratitude to the prison officers who acted as yoga teachers and provided valuable research assistance without which the study would not have been possible. We also thank Dr. Britt Hedman Ahlström for her insightful comments on the manuscript.

REFERENCES

1. Homel R, Thompson C. Causes and prevention of violence in prisons. In: O'Toole S, and Eyland S, editors. *Corrections Criminology*. Sydney, NSW: Hawkins Press (2005). p. 101–8.
2. Slade K, Samele C, Valmaggia L, Forrester A. Pathways through the criminal justice system for prisoners with acute and serious mental illness. *J Forensic Leg Med.* (2016) 44:162–8. doi: 10.1016/j.jflm.2016.10.007
3. Hofvander B, Anckarsäter H, Wallinius M, Billstedt E. Mental health among young adults in prison: the importance of childhood-onset conduct disorder. *Br J Psychiatr Open* (2017) 3:78–84. doi: 10.1192/bjpo.bp.116.003889
4. Markowitz FE. Mental illness, crime, and violence: risk, context, and social control. *Aggress Violent Behav.* (2011) 16:36–44. doi: 10.1016/j.avb.2010.10.003
5. Fazel S, Danesh J. Serious mental disorder in 23000 prisoners: a systematic review of 62 surveys. *Lancet* (2002) 359:545–50. doi: 10.1016/S0140-6736(02)07740-1
6. Sansone RA, Sansone LA. Borderline personality and criminality. *Psychiatry* (2009) 6:16–20.
7. Moffitt TE, Caspi A, Harrington H, Milne BJ. Males on the life-course-persistent and adolescence-limited antisocial pathways: Follow-up at age 26 years. *Dev Psychopathol.* (2002) 14:179–207. doi: 10.1017/S0954579402001104
8. Mohr-Jensen C, Steinhausen HC. A meta-analysis and systematic review of the risks associated with childhood attention-deficit hyperactivity disorder on long-term outcome of arrests, convictions, and incarcerations. *Clin Psychol Rev.* (2016) 48:32–42. doi: 10.1016/j.cpr.2016.05.002
9. Kriminalvården. *Rehabilitation - Swedish Prison and Probation Service | Kriminalvården* (2018) Available online at: https://www.kriminalvarden.se/swedish-prison-and-probation-service/rehabilitation/ (Accessed April 21, 2018).
10. Kerekes N, Fielding C, Apelqvist S. Yoga in correctional settings: a randomized controlled study. *Front Psychiatry* (2017) 8:204. doi: 10.3389/fpsyt.2017.00204
11. Sharma M, Haider T. Yoga as an alternative and complementary therapy for patients suffering from anxiety. *J Evid Based Complement Altern Med.* (2013) 18:15–22. doi: 10.1177/2156587212460046

12. Kahya HH, Raspin CG. Yoga therapy for the mind eight-week course: participants' experiences. *Explor J Sci Heal.* (2017) 13:116–23. doi: 10.1016/j.explore.2016.12.006
13. Streeter CC, Gerbarg PL, Saper RB, Ciraulo DA, Brown RP. Effects of yoga on the autonomic nervous system, gamma-aminobutyric-acid, and allostasis in epilepsy, depression, and post-traumatic stress disorder. *Med Hypotheses* (2012) 78:571–9. doi: 10.1016/j.mehy.2012.01.021
14. Rani K, Tiwari S, Singh U, Agrawal G, Ghildiyal A, Srivastava N. Impact of yoga nidra on psychological general wellbeing in patients with menstrual irregularities: a randomized controlled trial. *Int J Yoga* (2011) 4:20–5. doi: 10.4103/0973-6131.78176
15. Michalsen A, Jeitler M, Brunnhuber S, Lüdtke R, Büssing A, Musial F, et al. Iyengar yoga for distressed women: a 3-armed randomized controlled trial. *Evid Based Complement Altern Med.* (2012) 2012:408727. doi: 10.1155/2012/408727
16. Raghuram N, Deshpande S, Nagendra H. A randomized control trial of the effect of yoga on verbal aggressiveness in normal healthy volunteers. *Int J Yoga* (2008) 1:76–82. doi: 10.4103/0973-6131.41034
17. Bilderbeck AC, Farias M, Brazil IA, Jakobowitz S, Wikholm C. Participation in a 10-week course of yoga improves behavioural control and decreases psychological distress in a prison population. *J Psychiatr Res.* (2013) 47:1438–45. doi: 10.1016/j.jpsychires.2013.06.014
18. Klatte R, Pabst S, Beelmann A, Rosendahl JS. The efficacy of body-oriented yoga in mental disorders. *Dtsch Arztebl Int.* (2016) 113:195–202. doi: 10.3238/arztebl.2016.0195
19. Jeter PE, Slutsky J, Singh N, Khalsa SBS. Yoga as a therapeutic intervention: a bibliometric analysis of published research studies from 1967 to 2013. *J Altern Complement Med.* (2015) 21:586–92. doi: 10.1089/acm.2015.0057
20. de Manincor M, Bensoussan A, Smith CA, Barr K, Schweickle M, Donoghoe LL, et al. Individualized yoga for reducing depression and anxiety, and improving well-being: a randomized controlled trial. *Depress Anxiety* (2016) 33:816–28. doi: 10.1002/da.22502
21. Derogatis LR. The brief symptom inventory: an introductory report. *Psychol Med.* (1983) 13:595–605. doi: 10.1017/S0033291700048017
22. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, NJ: Erlbaum (1988).
23. Ströhle A. Physical activity, exercise, depression and anxiety disorders. *J Neural Transm.* (2009) 116:777–84. doi: 10.1007/s00702-008-0092-x
24. Battaglia C, Di Cagno A, Fiorilli G, Giombini A, Borrione P, Baralla F, et al. Participation in a 9-month selected physical exercise programme enhances psychological well-being in a prison population. *Crim Behav Ment Heal.* (2015) 25:343–54. doi: 10.1002/cbm.1922
25. Tolbaños Roche L, Miró Barrachina MT, Ibáñez Fernández I. Effect of "Exercise Without Movement" yoga method on mindfulness, anxiety and depression. *Complement Ther Clin Pract.* (2016) 25:136–41. doi: 10.1016/j.ctcp.2016.09.008
26. Balasubramaniam M, Telles S, Doraiswamy PM. Yoga on our minds: a systematic review of yoga for neuropsychiatric disorders. *Front Psychiatry* (2013) 3:117. doi: 10.3389/fpsyt.2012.00117
27. Vancampfort D, De Hert M, Vansteenkiste M, De Herdt A, Scheewe TW, Soundy A,et al. The importance of self-determined motivation towards physical activity in patients with schizophrenia. *Psychiatry Res.* (2013) 210:812–8. doi: 10.1016/j.psychres.2013.10.004
28. Visceglia E, Lewis S. Yoga therapy as an adjunctive treatment for schizophrenia: a randomized, controlled pilot study. *J Altern Complement Med.* (2011) 17:601–7. doi: 10.1089/acm.2010.0075
29. Kirkwood G, Rampes H, Tuffrey V, Richardson J, Pilkington K, Ramaratnam S. Yoga for anxiety: a systematic review of the research evidence. *Br J Sports Med.* (2005) 39:884–91; discussion: 891. doi: 10.1136/bjsm.2005.018069
30. Bhat S, Varambally S, Karmani S, Govindaraj R, Gangadhar BN. Designing and validation of a yoga-based intervention for obsessive compulsive disorder. *Int Rev Psychiatry* (2016) 28:327–33. doi: 10.3109/09540261.2016.1170001
31. Javnbakht M, Hejazi Kenari R, Ghasemi M. Effects of yoga on depression and anxiety of women. *Complement Ther Clin Pract.* (2009) 15:102–4. doi: 10.1016/j.ctcp.2009.01.003
32. Rocha KKF, Ribeiro AM, Rocha KCF, Sousa MBC, Albuquerque FS, Ribeiro S, et al. Improvement in physiological and psychological parameters after 6months of yoga practice. *Conscious Cogn.* (2012) 21:843–50. doi: 10.1016/j.concog.2012.01.014
33. Yoshihara K, Hiramoto T, Oka T, Kubo C, Sudo N. Effect of 12 weeks of yoga training on the somatization, psychological symptoms, and stress-related biomarkers of healthy women. *Biopsychosoc Med.* (2014) 8:1. doi: 10.1186/1751-0759-8-1
34. Woolery A, Myers H, Sternlieb B, Zeltzer L. A yoga intervention for young adults with elevated symptoms of depression. *Altern Ther Health Med.* (2004) 10:60–3.
35. Nijman H, Bjørkly S, Palmstierna T, Almvik R. Assessing aggression of psychiatric patients: methods of measurement and its prevalence. In: Richter D, Whittington R, editors. *Violence in Mental Health Settings - Causes, Consequences, Management*. New York, NY: Springer (2006). p. 11–23.

Conflict of Interest Statement: NK was employed by the Swedish Prison and Probation Service during the study.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 28 January 2021
doi: 10.3389/fpsyt.2020.600005

Perceptions and Attitudes of Correctional Staff Toward ADHD—A Challenging Disorder in Everyday Prison Life

Anna Buadze[1], Nadine Friedl[2], Roman Schleifer[3], Susan Young[4,5], Andres Schneeberger[1,6] and Michael Liebrenz[3]*

[1] Department of Psychiatry, Psychotherapy and Psychosomatics, Psychiatric Hospital, University of Zurich, Zurich, Switzerland, [2] Hospital of Psychiatry Münsingen, Münsingen, Switzerland, [3] Department of Forensic Psychiatry, Institute of Forensic Medicine, University of Bern, Bern, Switzerland, [4] Psychology Services Limited, London, United Kingdom, [5] Department of Psychology, Reykjavik University, Reykjavík, Iceland, [6] Psychiatrische Dienste Graubuenden, Chur, Switzerland

OPEN ACCESS

Edited by:
Katarina Howner,
Karolinska Institutet (KI), Sweden

Reviewed by:
Kolja Schiltz,
Ludwig Maximilian University of Munich, Germany
Märta Wallinius,
Lund University, Sweden

***Correspondence:**
Anna Buadze
Anna.Buadze@puk.zh.ch

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: 28 August 2020
Accepted: 30 November 2020
Published: 28 January 2021

Citation:
Buadze A, Friedl N, Schleifer R, Young S, Schneeberger A and Liebrenz M (2021) Perceptions and Attitudes of Correctional Staff Toward ADHD—A Challenging Disorder in Everyday Prison Life. Front. Psychiatry 11:600005. doi: 10.3389/fpsyt.2020.600005

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder that is associated with risk-taking behaviors, poor self-control, and interpersonal difficulties. Affected individuals have an increased probability of involvement with the criminal justice system, contributing to a higher rate of arrest, and imprisonment compared with the general population; they are also inadequately treated once sentenced. Because prison staff play a central role in the identification of inmates with mental disorders, they could well be key to improving provision of care. There is however little knowledge of the conceptions, perceptions, and attitudes of prison staff toward ADHD. Such information could help to identify starting points for awareness training and further implementation of specific ADHD treatment. To bridge this gap, we undertook a study based on a qualitatively-driven mixed methods design, combining qualitative data collection in the form of narrative interviews with 19 prison staff from a Swiss correctional facility with quantitative data collection in the form of a survey that included the Attitudes toward Prisoners scale. The interviews were analyzed with QSR NVIVO 11 and a qualitative content analysis approach was used to evaluate findings. Prison staff were generally aware of ADHD and its symptomology, believing it to a be "real," but "fashionable" disorder and favoring hereditary-genetic or biological explanatory models for its development. They viewed inmates with ADHD rather negatively, as complicating correctional efforts, and perceived them as sticking out, as tying up more resources and as frequently being involved in confrontations. Our findings suggest that difficulties in pragmatic aspects of communication and language comprehension may be perceived "as not listening or following instructions," creating additional tensions. Consequently, inmates with ADHD are more often exposed to disciplinary sanctions, such as solitary confinement—an intervention deemed "necessary" by staff. Therefore, staff training on ADHD might need to cover evidence on adverse effects. Non-pharmacological interventions for treatment were preferred and considered to be highly efficacious.

Skepticism toward pharmacological treatment prevailed, even when benefits from stimulant medication were described. Interestingly, this skepticism was not the result of negative experiences with the misuse and diversion of stimulants. Acceptance of multimodal treatment among prison staff may require customized strategies.

Keywords: attention-deficit hyperactivity disorder (ADHD), attitudes, correctional facilities/prisons, training and development, staff acceptability, knowledge-attitude-behavior, perception, qualitative research

INTRODUCTION

Over the course of the last decades, the established view in the medical literature has regarded attention deficit hyperactivity disorder (ADHD) as a neurodevelopmental disorder that is highly prevalent in both childhood and adolescence, which, if left untreated, can be accompanied by severe functional impairments (1–3). Those affected exhibit a triad of inattentiveness, impulsiveness and hyperactivity, and show limitations in multiple areas and through all stages of life (4–6). In comparison to healthy controls, individuals with ADHD not only have a higher rate of conflicts in partnerships, job losses, accidents, traffic offenses and substance use disorders, but are also more frequently involved in legal disputes, be they in civil or criminal law (7–10). The extent of the latter is best exemplified by current studies on the prevalence of ADHD among prisoners, which report rates of 20% to more than 40% for incarcerated individuals, depending on context (11–14). For example, a consecutive cohort study of 270 young adult male offenders from Sweden serving prison time for violent offenses, reported 63% ($n = 170$) of the total study group as fulfilling criteria for an ADHD diagnosis in childhood with a persistence of symptomatology in 68% ($n = 116$) of individuals affected, resulting in a prevalence of 43% of adult ADHD in this prison sample (11). A recent meta-analysis pooled 102 original studies from 28 countries published between 1985 and 2017 that included 69,997 individuals living in detention and reported a prevalence rate of ADHD in prison settings of 26.2% (15). While there has been some debate surrounding the diagnostic accuracy of self-assessment instruments affecting the overall reliability of prevalence rates of ADHD in prisons (16, 17), the authors furthermore found no significantly different prevalence estimates between studies using screenings for ADHD and those using clinical interviews (15). Compared with the prevalence of ADHD among the general population, the reported rates represent a 5–10-fold increase for people living in detention (18). On the other hand, there are studies showing that the real possibilities of care for inmates with ADHD are very limited, both in terms of access to diagnostic assessment and initiation of multimodal treatment (19–21). In addition, it has been observed in everyday clinical practice that the continuation of pharmacological therapy for patients treated with stimulants before imprisonment is also extremely complicated and unlikely (22). This lack of care may reflect the challenges faced by those working in the prison system against the background of the comorbidities (conduct disorder, antisocial personality traits or disorder, comorbid substance use disorder) overlapping neurodevelopmental disorders (Autism Spectrum Disorder, Tic Disorder, Intellectual Disability) and emotional dysregulation frequently encountered among inmates with ADHD (11, 20, 23). One point repeatedly mentioned in the literature is the fear of diversion and distribution of prescribed stimulants to other inmates (24). For example, Burns argued for a limit to prescription of stimulants in prisons and developed a "top ten reasons" for doing so (25). He based his argument on the high prevalence of substance use disorders in prison and feared the potential of misuse, the possibility of diversion in exchange for money and the intimidation of inmates with ADHD to surrender prescribed stimulants to others. Additionally Burns expressed concern about security, but also envisioned administrative challenges for prison health staff and increased direct and indirect costs. In light of the availability of non-stimulant alternatives and the probability of drug-seeking or manipulation to obtain the medication (malingering) he thus advised against the ready availability of stimulants without a treatment protocol. Indeed, in some jurisdictions, the distinct preference for pharmacologic treatment with non-stimulant medications (e.g., tricyclic antidepressants, bupropion, and venlafaxine) seems to contribute to low treatment numbers and decreased adherence of inmates with ADHD, even when a treatment protocol has been implemented that offers stimulants to those inmates who have failed treatment with one or more non-stimulant agents (24). For example, Appelbaum et al. reported a stimulant treatment prevalence of only 0.7% over a 24-month period in a correctional system that had 16,795 potential male candidates for treatment (26). The lack of access to first line pharmacological stimulant treatment for adults with ADHD is all the more surprising as studies on its effects on criminal conviction rates are already very informative. For example a pharmacoepidemiologic study among 25,656 Swedish individuals with a diagnosis of ADHD reported that for those patients receiving stimulant medication, there was a significant reduction of 32% in the criminality rate for males and 41% for females (27). On a different note, the same study did not report the same violence prevention effects for those adults who were prescribed antidepressant medications as an alternative to stimulants (27).

It has long been understood that prison staff plays a central role in the identification and provision of care for inmates with mental disorders in general (28). In particular, raising awareness of ADHD is considered to be essential, for example, by the Attention Deficit Disorder Association (ADDA) and its ADHD Correctional Health/Justice Work Group or a recently published expert consensus (21). There is however little knowledge of the conceptions, perceptions and attitudes of prison staff toward

ADHD, although this information could help to identify starting points for the development of awareness training and to further the implementation of ADHD specific treatment approaches. For example, it has not been investigated whether prison staff-perceive ADHD to be a mental disorder at all, and, if so, endorse biological and medical explanatory models or believe that it can be caused by environmental factors, such as poor parenting, malnutrition or errors during schooling (29, 30). Furthermore, prison staff are usually not trained in management strategies of offenders with ADHD, so personal experiences on "what works, and what doesn't" become highly important when staff interact with inmates affected, for instance when making decisions about disciplinary sanctions. Further, the attitudes and experiences of prison staff toward treatment in general, and pharmacological (stimulant) and non-pharmacological interventions in particular, is unknown, despite these being important pillars in ADHD care.

Here, we propose to explore these gaps by undertaking a mixed method design study, which aims to qualitatively:

- Investigate whether prison staff perceive ADHD to be a mental disorder,
- Explore prison staff beliefs regarding the causes of ADHD,
- Elaborate on past experiences with inmates with a diagnosis of ADHD,
- Identify prison staff's view on the role of therapies in ADHD management during times of detention, and quantitatively:
- Evaluate prison staff's personal attitudes toward offenders and their potential for rehabilitation in general.

This quantitative element was included in order to situate the narratives of this sample in the context of their overall attitudes toward offenders, thus providing a framework for interpreting the qualitative findings reported. It might be that this Swiss sample distinguishes itself from correctional officers in other jurisdictions, for example by having a far more positive attitude toward rehabilitation, which would construe a limitation and a further obstacle in the generalization of our findings.

METHODS

Study Design and Reporting

This study employed a qualitatively driven mixed methods design combining qualitative data collection in the form of narrative interviews with quantitative data collection in the form of a survey (31) to investigate prison staff attitudes toward mental disorders such as schizophrenia, substance use disorders, and ADHD. For the purpose of this article we focus on ADHD and report our findings following consolidated criteria for reporting qualitative research (COREQ) guidelines (32).

Sampling Procedure and Setting

A modified site-based approach was used to identify and recruit study participants from Realta prison, located in the Canton of Grisons, Switzerland (33). It is operated as an "open" correctional facility under regional authority with a capacity of 120 for male prisoners who work outside the prison and have up to 36 h of leave per week. During their stay in prison it is compulsory for detainees to pursue work activity. A number of working areas are available for this purpose, ranging from a market garden to farming on a cultivated area of 136 ha (336 acres), 300 cattle, 60 dairy cows, 100 large livestock, to a carpenter's shop, a butcher's shop and a technical workshop for repairing farming equipment.

Because we expected professional background, function and position, years of employment, gender and age to be important correlates of variation in attitudes and perceptions of prison staff toward mental disorders, these were the characteristics of interest when approaching a "gatekeeper." The importance of gatekeepers in recruitment of participants from hard to reach communities and complex societies has been described elsewhere (34). In the study at hand, an employee of the Department of Justice, Health and Safety of the Grisons served as the initial point of contact, provided information on the site staff members and helped the researchers to identify individuals who would be appropriate for the study (i.e., had the ability to complete an in-depth interview). In order to minimize possible bias on the part of the gatekeeper in selecting participants, considerable effort was made to ensure recruitment of a sample that incorporated diversity, also in respect of interest in the research topic (or lack thereof). For example, an agreement was reached beforehand that study participation could not only be carried out during regular working hours, but would also be counted as full working time for participants. For logistical reasons recruitment continued past the point where saturation was reached.

Data Collection and Interview

To investigate whether prison staff perceive ADHD to be a mental disorder, to explore participants' beliefs regarding the causes of ADHD, to elaborate on past experiences with inmates with a diagnosis of ADHD and to identify prison staff's views on the role of therapies in ADHD management during times of detention, we conducted single, semi-structured, in-depth interviews lasting between 25 and 66 min, with an average duration of 51 min. We used a self-developed and flexible interview guide which also covered attitudes toward other mental disorders. Two female researchers (NF and AB) conducted the interviews. NF was at the time a Master's student at the Faculty of Human Sciences, Institute of Psychology, preparing a thesis under the supervision of ML, a forensic psychiatrist and faculty member of the medical school. AB, an attending physician at the Psychiatric University Hospital, Zurich who headed the specialized outpatient clinic for ADHD and had experience in qualitative interviews, trained NF and conducted the initial two interviews in the presence of NF. Subsequent interviews were all conducted by NF with regular feedback given by ML based on audiotapes and transcripts.

The research team itself had gathered previous experience in employing qualitative research methodology on perceptions toward ADHD, SUD, and psychosis among the general population, medical and legal experts and affected individuals. Results have been reported elsewhere (22, 35–38).

Before the interviews, participants had an understanding that NF had a background in psychology and that the research represented a collaboration between the Department for Justice, Health and Safety, Grisons, and several psychiatric institutions and that the research would address prison staff's experiences with inmates suffering from a wide variety of mental disorders.

All interviews were conducted in Swiss German, an Alemannic dialect spoken in the German-speaking part of Switzerland and in some bordering Alpine communities. Participants were encouraged to speak this dialect in order to make them feel more comfortable. Open-ended questions and non-leading probes were used to encourage participants to speak freely and to elaborate on their statements. Paraphrasing and summarizing main points during the interviews helped minimize misunderstandings and clarify ambiguous statements. Interviews were—with the exception of the initial two interviews—conducted on a one-to-one basis and were digitally recorded. Field notes were taken afterwards.

By grounding the questions in participants' practice experiences, and by reformulating the questions, we sought to avoid generalized responses. All interviews took place in an office of the correctional facility. The office was reserved for the interviews to ensure that interviewer and participants were undisturbed. Water was available as a refreshment. There were no repeat interviews.

All subjects provided additional biographical data and provided information in regards to education, work experience and experiences with mental illness in the form of a digital survey. The questions formulated for this purpose resembled a survey previously used by Callahan et al. (39) and is provided as supplemental material (**Supplementary Table 1**) Additionally, a German version of the Attitudes toward Prisoners (ATP) scale was used to evaluate prison staff's personal attitudes toward inmates without a mental disorder. The ATP scale was translated from English into Standard German by NF and checked for plausibility and comprehensibility by ML. The original English version of the ATP was developed by Melvin et al. and consists of 36 statements about detainees of prisons, for example: "Prisoners are different from most people," "You should not expect too much of a prisoner," "Prisoners are just plain immoral" (40). Staff was then asked to rate these statements with respect to inmates on a 5-point scale ranging from strongly disagree to strongly agree. Total score can range between 0 and 144, with a score of 72 indicating a neutral attitude. The original ATP has a moderate to high internal consistency and test-retest reliability ($r = 0.82$). To obtain biographical data and to conduct the ATP, a survey was set up employing REDcap software (41) enabling participants to fill in the questionnaire onsite using a mobile device.

Data Analysis

Interviews were digitally recorded using an Olympus DS-7000 voice recorder and then transcribed verbatim into Standard German. Whereas, Swiss German is commonly only spoken, Standard German is traditionally used in writing and transcription in Switzerland, which is why all interviews were written down in Standard German using a word processor (Microsoft Word). After removing identifying information, each transcript was assigned a code number. The transcripts were not returned to the participants. Subsequently the transcripts were uploaded into QSR NVIVO 11 for Windows (see below).

The procedure regarding the content analysis differed only slightly in comparison to previous studies by our research group and has been described in detail before (22). Qualitative analysis of the interview data was done independently, initially by NF focusing on SUD, and subsequently for the purpose of this publication by AB and ML. AB and ML analyzed the material blinded as to participant identity. A comparison thematic approach, identifying common and new themes related to the research aims was used. For this research, the interviews were analyzed with QSR NVIVO 11 for Windows, a qualitative data analysis software (QDAS) (42). This software was used to organize the semi-structured interviews, to set up case nodes, to code emerging themes and to visualize the data. Coding centered on identifying common and unique themes related to the research aims, as well as omissions within the interview transcripts.

The coding process ensured a systematic, comprehensive, and detailed reading of each interview transcript. First, the coders familiarized themselves with the transcripts in order to identify the different subjects of interest. After several interviews had been coded, the categories for the study were redefined, reviewed and revised in a consensual manner at meetings between AB and ML. When there was disagreement regarding the coded material, ML applied the final code. As a result of the coding process and for the purpose of this paper, four main categories were identified and selected: (a) personal stance toward ADHD, (b) explanatory models, (c) experiences with previously diagnosed inmates, and (d) attitudes toward necessary interventions. An overview of the categories is shown in **Figure 1**.

To illustrate the categories and for reporting purposes, examples of coded quotations were chosen by AB and ML and translated from German into English by ML. Deepl Translator a machine translation service launched in August 2017 was used to support and simplify this translation process. Quotations were then improved by a bilingual German/English speaker (ML) and edited by an English native speaker (Heather Murray) to ensure readability for an international audience.

The quantitative sociodemographic data were evaluated using SPSS version 24. Attitudes toward prisoners with and without a mental disorder were compared using paired sample *t*-tests and Bonferroni correction ($p < 0.00138$).

The research was conducted in accordance with the 1964 Helsinki Declaration and was authorized by the independent ethics committee (IEC) of the faculty of Human Sciences of the University of Bern. All participants were assured confidentiality, and gave their written informed consent for the study and, specifically, for the digital recordings of the interviews.

RESULTS

Sample Descriptions

During this study the research team established contact with 21 subjects. Of these, one declined to participate. The barrier to participation for this potential participant could not be determined. Another potential subject who had initially agreed to participate was impeded due to an unexpected illness. The scheduling of the interviews proved to be complex, as the employee's absences and changes in work shifts needed to be considered. Despite careful planning, several appointments had to be rescheduled because of unexpected changes in the shift

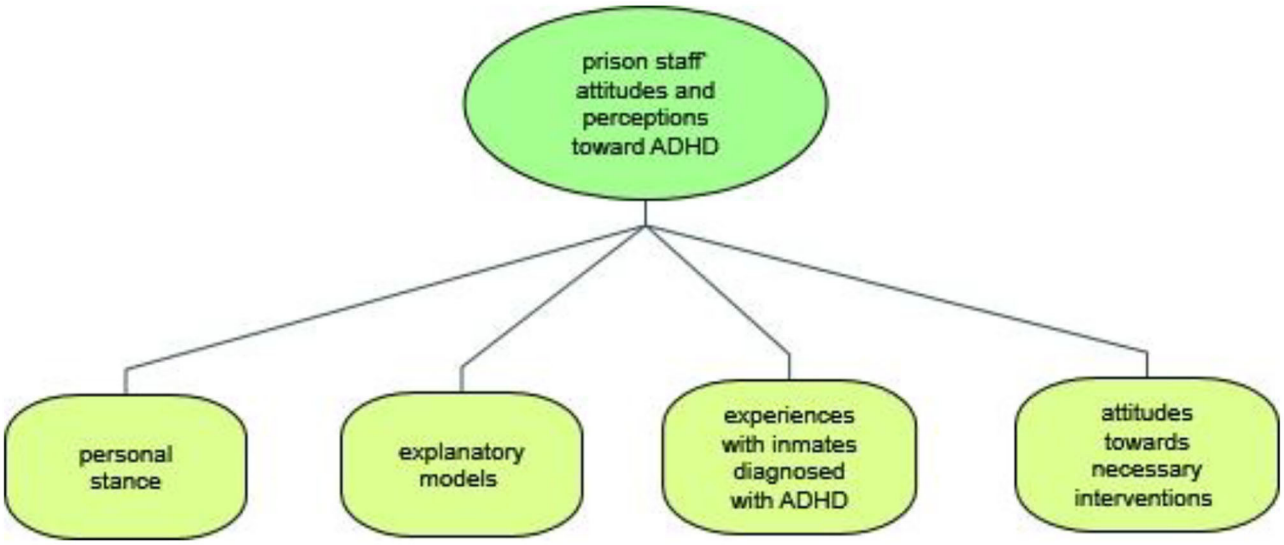


FIGURE 1 | Main categories of prison staff attitudes and perceptions toward ADHD.

plan, which however did not lead to reduced participation. On the contrary, subjects showed great interest in the research topics. In total, 19 subjects provided their written, informed consent. All completed the interview. None of the participants withdrew their consent at a later time.

The final sample (n = 19) was composed of a higher percentage of male staff (73.3%) than of females (26.3%). The mean age of the participants was 50.4 years (± 10.6 years) with a mean of 15.9 years (± 11.6 years) of working experience in the correctional system. The vast majority of participants (84.2%) had completed vocational training outside the prison system and received a federal diploma before starting to train as correctional officers, as this is a prerequisite for an application to justice department authorities in most cantons (43). As intended, the professional backgrounds of the participants reflected great diversity and ranged from training as a farmer, forester, agricultural machinery mechanic, head cabinetmaker, nurse, surveyor to cook, bricklayer and precision mechanic. Regarding their specific correctional training, 94.7% of participants stated that mental disorders were covered in some form, at least theoretically during courses. A total of 72.2% judged their training on this topic to be sufficient for their everyday professional life. On the other hand, only 52.6% reported having been specifically trained to work with people in detention suffering from mental disorders, while a further 30% held the belief that the training they had received was insufficient to prepare them for situations they had encountered while working in the correctional facilities. The majority of participants had had experience with mental disorders in their private environment. Over 70% knew someone who had consulted a psychiatrist or a clinical psychologist or who had been treated as an inpatient in a mental health institution. A further 15.6% believed they suffered or had suffered from a mental disorder themselves. More detailed baseline demographics of participants are illustrated in **Table 1**.

TABLE 1 | Baseline demographics of participants.

Sociodemographic variables	n = 19
Age (mean ± SD)	50.4 ± 10.6
Gender, male (n, %)	14 (73.7)
Nationality, Swiss (n, %)	17 (89.5)
Years working in the correctional system (mean ± SD)	15.9 ± 11.6
Highest education (n, %)	
Apprenticeship	7 (36.8)
Higher vocational school	9 (47.4)
University degree	3 (15.8)
In possession of a vocational and education training diploma, yes (n, %)	16 (84.2)
Career training as a correctional officer started/graduated, yes (n, %)	10 (52.6)
Some knowledge about mental disorders was imparted during training, yes (n, %)	18 (94.7)
Caring for people in detention with a mental disorder practiced during training, yes (n, %)	10 (52.6)
Knowing someone who consulted with a psychologist/psychiatrist, yes (n, %)	15 (78.9)
Knowing someone who sought treatment in an inpatient psychiatric hospital, yes (n, %)	14 (73.7)
An acquaintance	5 (26.3)
A friend	2 (10.5)
A family member	5 (26.3)
A relative	2 (10.5)
Have/ had the feeling of suffering from a mental illness themselves, yes (n, %)	3 (15.8)

Quantitative Research Findings

As mentioned in section Data collection and interview, the ATP questionnaire was used to gather the data related to the

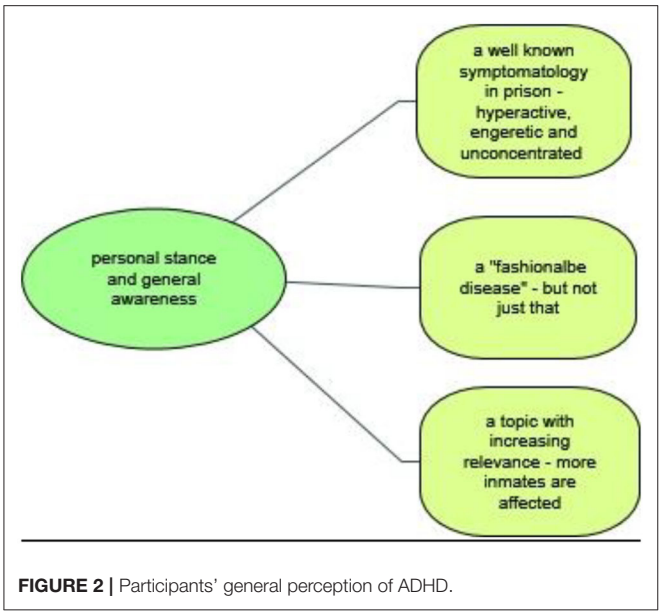


FIGURE 2 | Participants' general perception of ADHD.

participants' attitudes toward inmates. The possible scores of the ATP questionnaire can range from 0 to 144. An individual with a low score views offenders negatively, as deviant and as incapable of rehabilitation and/or of positive change, whereas a high score is indicative of a more favorable positive attitude toward inmates. All interviewees completed the ATP questionnaire. The mean total ATP score of this sample was 90.58 (SD= 16.804).

Qualitative Research Findings

In qualitative research, saturation is commonly defined as the point when no new themes arise and was achieved in this study after 15 interviews. Because additional interviews were agreed upon prior to reaching saturation, these were followed through with.

Participants' General Perception of ADHD

A Well-Known Symptomatology in Prison: Hyperactive, Energetic, and Unconcentrated

Unexpectedly and across all occupational groups, all participants had heard about the disorder and/or had had personal experience with inmates with ADHD, expressing themselves in a complex way on the topic (**Figure 2**). Furthermore, some of the participants interviewed by us mentioned ADHD or ADHD-like symptomatology in the context of their general and/or opening remarks on how to deal with detainees with mental disorders. It became clear that the disorder and its resulting effects on everyday prison life had reached the general consciousness of the prison staff. This assessment can be exemplified by the statement of one staff member who remarked that he "did not know that ADHD existed in adulthood until he started working in prison." The description of the symptomatology, although presented by laypersons, deviated only in nuances from the terminology used in medical literature and revolved around terms such as "high-energy," "explosive," "hyperactive," "unfocused," and "unconcentrated."

> *Yes, what strikes me in the prison is that there are always psychologically remarkable inmates who cannot keep to the rhythm of everyday life. For example, I didn't know there were, uh, adults with ADHD. I didn't know that. And when you (meet) such prisoners later on, they attract attention when they are so hyperactive. But I did not know until then that this was due to ADHD. I didn't understand it, until I came to work here.*
> *ID 9*

A "Fashionable" Disorder—But Not Just That

In view of the reservations described in the literature about ADHD, it was important for us to depict in particular the general attitude and any skepticism of prison staff. For this purpose, we used follow-up questions that dealt with the characterization of ADHD as a "fashion diagnosis," hence a diagnosis that is currently enjoying particular popularity. While participants considered the disorder to be "fashionable," similar to the diagnosis of "burn-out," the majority were of the opinion that the "phenomenon" existed, i.e., that there was a "true core" behind it. The interviewees considered the "accuracy" of expert diagnosis as the basis for initiating treatment to be a major problem; they thought that experts were not able to accurately differentiate between those who are impaired but "generally o.k." and those requiring pharmaceutical treatment. In this context, comparisons to "past-times" were repeatedly made, arguing that, today, all those who could not "function" received a diagnosis, whereas "nervous-fidgety" behavior would just have been accepted by society in the past. Although these statements evoke the idea of "overdiagnosis," such explicit wording was not used by our participants.

> *Um, I think it's a really hard disease to diagnose, I strongly believe that. And I actually think that some, um, professionals can't really diagnose it clearly. But I think this phenomenon exists. It really does exist.*
> *ID 8*

> *Yeah, it is like "burnout", it's fashionable. It's not easy in the professional world. But when such a hyperventilated (hyperactive, ed.) child tests the limits, I would claim that not everyone has the problem. There are certainly half of those with ADHD who actually have the disease and a dysfunction. But often it is also the case that someone acts out in the school yard, [thinking] when I act out, I'm accepted, then I'm somebody.*
> *ID 10*

A Topic With Increasing Relevance – More Inmates Are Affected

Irrespective of reservations about the assessment of ADHD, the disorder was deemed to be a topic of increasing relevance, as more inmates were perceived to be affected and/or diagnosed. Our participants based these perceptions on their many years of experience in the correctional system. In this context, too, it became clear that skepticism about the "existence" of this disorder had generally diminished after joining the prison work force and gaining "hands on" experience.

Yes, yes we have ADHD too. Also rising. (...) I think the whole thing will increase in the next few years. This is becoming more and more [common].
ID 13

Participants' Explanatory Models

In our sample almost all participants had developed explanatory models about the origin of ADHD (**Figure 3**). Only two stated that they had no idea about the causes of this disorder and spoke in general terms of "something with childhood." Although each individual's etiological concept was somehow unique, it was possible to identify common major themes and shared features. It should be noted, however, that some overlap between themes occurred. The majority of prison staff identified more than one contributing cause and had adopted a multi-factorial explanatory model. We identified three major themes on perceived causation, which we characterize below, starting with the most commonly expressed perception.

Biological and Genetic Models

Most frequently participants associated the development of ADHD with hereditary-genetic or, more generally speaking, with biological causes, indicating a clear preference for scientific explanations. Occasionally, birth complications (asphyxia) or consequences of alcohol consumption during pregnancy were mentioned.

"I think it's genetic, I think it's uh biologically phew yes I think genetic and biological above all. So I think the environment has less of an impact. I think the environment has an impact on how someone deals with it. But for the onset of ADHD, that does not arise from bad (…) social influence. Yes genetically, biologically, like that."
ID 15

Environmental and Socio-Cultural Models

Less frequently, prison staff identified environmental, parental, or social factors as the main reason for developing ADHD. Factors like increased media consumption, disproportionate use of computer and communication devices, and an overflow in day to day activities were mentioned. The main motive identified was "social pressure" as exemplified below:

"I think also familial probably. Their whole youth, their upbringing, school – all around. The whole environment that has developed differently now compared to some years ago, because the pressure from outside is greater and the parents, and many are children of foreigners, where this is just one problem and it goes wrong in many other directions. They do not learn German at home and that's an additional problem. So I think that's already a big part of the problem."
ID 13

Esoteric Models

Mystical explanatory models were adopted by one participant. This explanatory model was linked to a perceived simple solution for symptoms, in this case the consideration of "water veins" and "bed-positioning."

"*It may also have been experienced, perhaps even electro-smog in childhood, I could imagine. Or someone always lies over a water pipe as a child, a water vein …, that's it. I could imagine. The parents are desperate, go to the doctor, get medication, everything and, in the end, it would have been that one only had to change the [position of the] bed*"
ID 11

Participants' Experiences With Inmates Previously Diagnosed With ADHD in a Prison Setting

Our participant sample had gathered a great wealth of experience in dealing with detainees diagnosed with ADHD during various stages of incarceration and in a multitude of everyday prison life situations (**Figure 4**). Although the professional backgrounds of the interviewees differed substantially, and the interactions reflected different areas of responsibility, such as security, vocational rehabilitation or health service provision, views, and impressions overlapped considerably and revolved around the same difficulties.

In addition, it must be noted that a majority of prison staff, irrespective of professional background and line of work, seemed to be aware of the mental health status of inmates, indicating a simplified passing on of medical information in this prison. This was justified by the necessities of a strongly labor-oriented correctional facility, in which some jobs assigned to inmates required, for example, the operation of heavy machinery. In this context, it was explained that medical information, such as prescription drug use, must be transparent to most staff.

Sticking Out and Standing Out

Analysis identified several important interwoven factors which, in the eyes of prison staff, complicated correctional efforts on an individual level and moreover impacted inmates collectively. Participants had experienced inmates with ADHD as "sticking out and standing out" and perceived them as loud, temperamental, fidgety, quickly frustrated, and verbally aggressive. It was commonly reported that this group of detainees were the ones who violated prison rules. In the eyes of the participants, they were the ones who wanted to leave the cell after lock-in, were unorganized and missed appointments, for example, in their work environment or in health services, and did so even when this meant incurring significant disadvantages. Other prison staff indicated that inmates with ADHD required longer and more repetitive instructions, more explanations and generally more attention compared to prisoners who did not have this disorder. In this context, some participants acknowledged different degrees of severity of the disorder, resulting in varying impairments of social functioning.

Those who are always tingly, can't sit quietly, are always on the move – and that's difficult in the evening when they're locked up. In the first days these are the ones that constantly ring (the bell) and ask if they can be let out for a moment, because they have to run. But that, uh, yes in the night you have time to explain why it's not possible and why they have to stay in overnight (...) and that is enough even if you just take the 5 min to quickly talk to them.

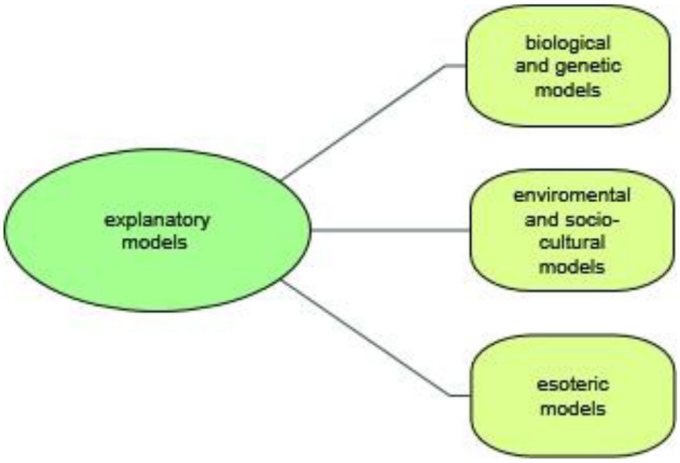


FIGURE 3 | Participants' explanatory models.

And then they have the feeling that "I'm not alone", and at night it's very quiet in the prison, so it's possible. Just a few words can help. I have the feeling they need a bit more attention now and then, uh, by the fact that they can get medication from us of course, uh, there is automatically a short conversation and that every now and then I have the feeling they want that, too.
ID I

The inmate with ADHD just stands out, he simply stands out among all the others. Or if he's burdened with that. He can't sit still and things just don't work out. Always compared to those who do not have the syndrome (...): Yes, and that they have no patience. Or that they overreact at work as well and also their temperament, I think that they are more quickly frustrated and become aggressive.
ID 9

Conflicts With Other Inmates

A majority of prison staff suggested that inmates with ADHD often came into conflict with other inmates. Surprisingly, this was not only perceived to be the result of impulsive-uninhibited behavior targeted directly at other prisoners, e.g., in the sense of verbal or physical assaults, but was seen as a consequence of the increased social attention given by prison staff, which is envied by other inmates. Because inmates with ADHD demanded longer explanations, this time was then not available to other detainees. Unlike other more obvious debilitating mental disorders, such as schizophrenia, prisoners with ADHD are not perceived as mentally ill by fellow inmates, which is why behavioral abnormalities are less accepted and do not evoke sympathy.

This is noticeable among prisoners with ADHD. The other prisoners, the collective body, see these prisoners less as ill. If someone has schizophrenia and is clearly behaving strangely, then the illness aspect is not questioned among inmates. But someone who takes up a lot of time, for example from the foreman, in consulting, that is seen critically. We have office hours and people can come up to the floor and, when the caregiver is free, they can come into the office and chat. You just take turns. And sometimes there are remarks to those with ADHD: "Oh you again, you have a torrent of words today." And in fact, we really need more time with them. And sometimes this really causes friction among the detainees.

I would actually say that these are not the ones that are considered sick. They are rather those who are considered to be buzzing and noisy, always scrounging and such.
ID 9

Yes, they're very, very, very difficult, how shall I say, to handle. They talk too much, they are, uh, restless and that makes it very difficult for the others to accept them as they are. I think it's generally difficult for these men in a community (laughs). I think.
ID 12

Require and Tie up More Resources

Almost all respondents experienced the care of detainees with ADHD as labor- and time-intensive, energy-consuming, and generally exhausting. While it was perceived as very important to establish structure in day-to-day routines and a schedule that is both organized and predictable, it was exactly those things that were found to be most challenging to implement, when dealing with this group of inmates. In this context it was often mentioned that inmates with ADHD were easily able to upset carefully crafted prior schedules, if these behaviors were not monitored and managed well.

Yeah, um, I'd say it's the hustle and bustle. They are so difficult to handle, um, because you have to structure them well from the outside, because otherwise it will roll over you or make an hour out of 10 min.

In order to deal with them, as an advisor or also in the security service, it is necessary to give really clear instructions. Make straightforward announcements, try to put things in order. Especially when the inmate talks a lot. Ask what's important now. They can be very big energy guzzlers. They can turn all your work upside down because everything is so insanely important, right now.
ID 8

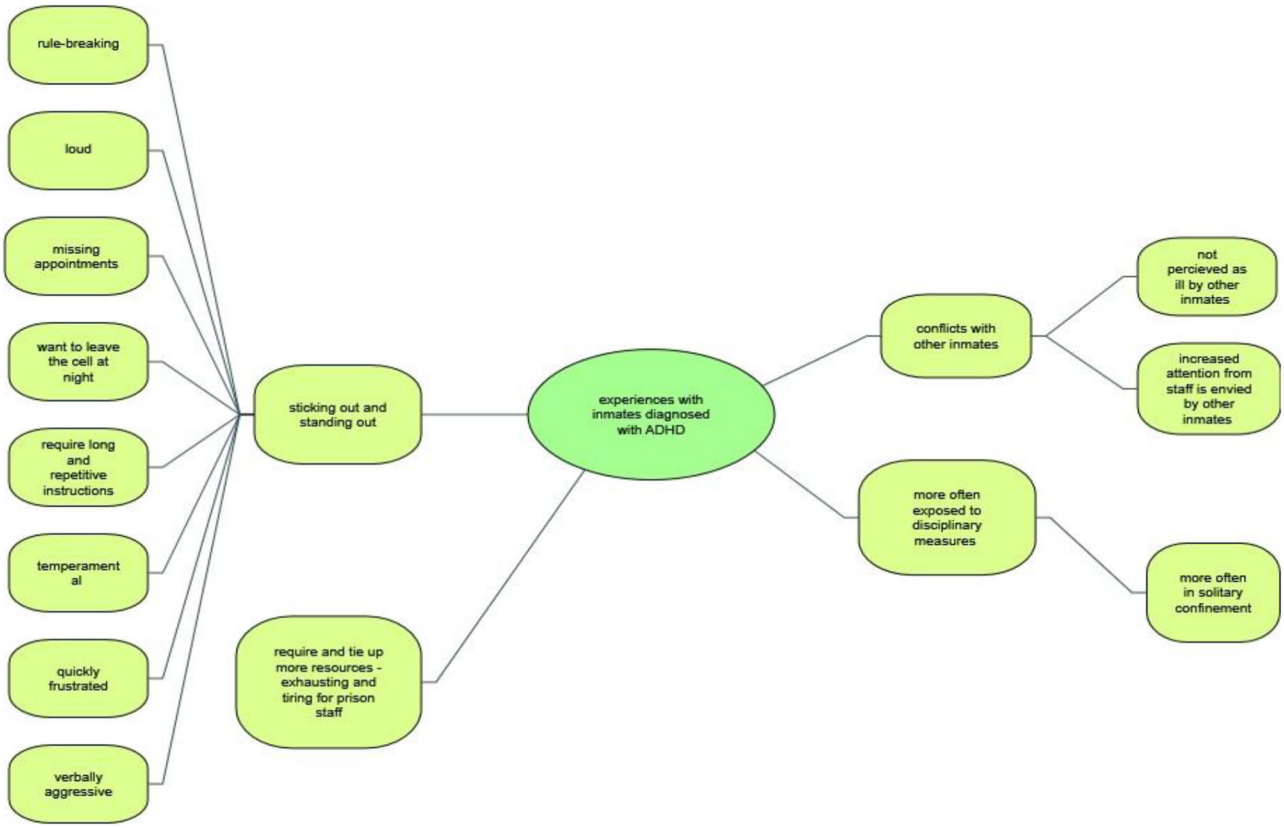


FIGURE 4 | Participants' experiences with inmates previously diagnosed with ADHD.

More Often Exposed to Disciplinary Measurements

Security staff in particular described in great detail the inability of inmates with ADHD to regulate themselves and to stop impulsive behavior, which quickly manifested itself in verbal lapses in times of frustration. In the eyes of security staff, this results in more disciplinary sanctions being imposed on inmates with ADHD, such as placement in solitary confinement. A few of the staff had noticed that such a massive restriction of freedom of movement among this group of prisoners only increased undesirable behavior, but deemed this to be a necessity in order to enforce prison rules and to ensure equal treatment for other inmates. In this context, some staff also indicated that, for those placed in solitary confinement, psychiatric support was not always available quickly enough.

> *Yes, very time-consuming. 'Cause this could go well for a moment, and then they'll be back somewhere up on the roof. You have to get them back down and if it goes well, everything is fine, but then they do something stupid like using the word "asshole" and they are back in solitary confinement. Naturally that is not possible. That's not possible for others either. Then they are back in confinement and problems are inevitable. They want to get out, they want to smoke, they want "grass," they want this and they want that, they are constantly on the "bell" yes, yes, it is time-consuming.*
> *ID 13*

> *Now, while we are talking, one's in solitary confinement for five or 6 days and he's already in trouble. We have to move him to another facility now, because it's no longer possible for us to keep him here. He also goes from zero to 100 in no time and won't calm down. He's a real "Ritalin-boy," too. He really needs to be seen by a psychiatrist, but he is only here for 20 days and nobody is going to yank out a leg ("bust a gut") over this. He will be in solitary confinement for another 10 days and then he will be released and we will not hear from him again for 1 or 2 years. Then he might return. If they are here for such a short term, there is no chance that a psychiatrist will see them. No chance.*
> *ID 13*

Attitudes Toward Necessary Intervention

The vast majority of our sample were of the opinion that dealing with inmates with ADHD required a specific approach and had, over the years, themselves developed a variety of interventions that they deemed useful. Regarding treatment for ADHD, almost all interviewees expressed a strong preference for psycho-social interventions, behavioral measures and cognitive training (**Figure 5**).

Non-medical Interventions

Prison staff specifically mentioned coaching, providing structure, positive reinforcement, time, and support when asked about necessary interventions. The meaning of support was interpreted

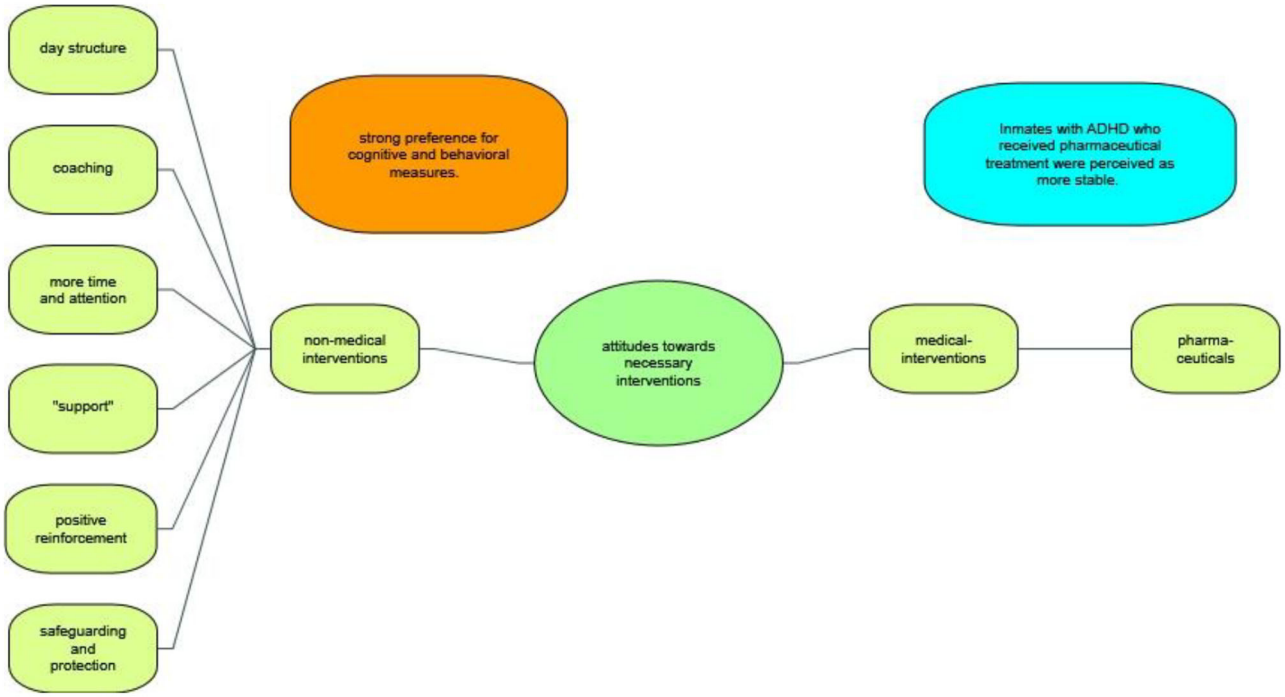


FIGURE 5 | Attitudes towards necessary intervention.

heterogeneously. For example, one staff member reported that he specifically tried to fatigue prisoners with ADHD by pushing them to their physical limits. Interestingly, some staff also found that necessary interventions consisted of safeguarding and protecting affected inmates, and suggested establishing a specific ward for inmates with mental disorders.

> *So I think, uh, interventions gonna have to take place more on the behavioral level. So they need clear structures, clear instructions, no arguing. So I think that is important with ADHD, for people with ADHD. (. . .) And today I think it's possible to change something, but it's, uh, I think a very big effort, in self-control. And although I think that a drug can be helpful, first and foremost it should be about cognitive and behavioral measures. In my eyes.*
> *ID 15*

> *With me it's good for them, because when they work with me, they can really give it a go. If I know that one of the detainees has ADHD, then I give him a job that normally two people do. "Put the three stones on the bus." And if he can do that, that is a form of intervention (medication) without him knowing or realizing it. But that he is exhausted in the evening, that he is needed, that is also healthy.*
> *ID 10*

Medical Interventions

Although inmates with ADHD who were prescribed stimulants such as methylphenidate were perceived as more stable, easier to live with and better manageable for staff, almost all participants showed a certain reluctance toward the necessity of pharmaceutical interventions. None of them was completely against stimulant treatment; however, they clearly did not see it as a viable first-line treatment.

> *Ritalin. If this is well-adjusted and they get it, then, uh, they work fine in here. But they're a little more demanding, I'd say on the average. So they need more attention from us and if they have the medication of course, then it's easy, then it's possible.*
> *ID 17*

> *Some of them are in need of protection. Sometimes you have to, uh, practice with them to get through everyday life here. Help them to acquire knowledge about the structures so that they can learn to move here. Um, they need treatment in the sense that they are medicated, that they are also under psychiatric care and observation, this support has to be guaranteed, so that changes are noticed.*
> *ID 8*

DISCUSSION

In the present qualitatively driven mixed methods study, we investigated the general view and awareness of ADHD held by Swiss prison staff, explored their beliefs regarding causes of this disorder, inquired about experiences with inmates with a diagnosis of ADHD and identified attitudes toward ADHD management during times of detention.

Our qualitative findings on the subject of ADHD should be interpreted in the light of this sample's fairly negative attitude toward offenders in general, as measured by scores

on the ATP. The mean score of prison staff participating in this study was 90.58 (SD = 16.804), which is very similar to scores reported for correctional officers from the USA (90.7), Norway (90) and the United Kingdom, but substantially lower than, for example, scores reported for graduate students in psychology working in the Alabama prison project (113.2) (40, 44, 45). It is therefore not a sample that distinguishes itself by a particularly positive or optimistic attitude toward offenders and their potential for rehabilitation, but it is comparable in attitude to other correctional personnel from jurisdictions with a more punitive approach (46). This result is surprising for two reasons. Firstly, the sample includes staff from a semi-open prison, which traditionally has a strong rehabilitative character within the Swiss correctional system, and secondly, the majority of the participants were not solely focused on security operations, as employees in this area are known to have more negative perceptions (45, 47).

Our results indicate that prison staff working closely with inmates during different stages of incarceration and in a multitude of prison life situations are aware of ADHD and—very specifically—its core symptomatology. In fact, ADHD as such, is an actively discussed topic among prison staff with various professional backgrounds and believed to be of increasing relevance. Interestingly, the skepticism of staff toward the existence of a "Fidgety Phil Syndrome" and the classification of this form of "behavioral abnormalities" as a mental disorder decreased when they started to work in a prison environment, a finding that even held true for individuals who had previously gained experience in general psychiatry. Several explanations for this finding seem plausible: Firstly, it may be simply more likely for staff to encounter individuals with ADHD in a correctional facility, considering that the prevalence of individuals with ADHD symptoms is higher by a factor of 5–10 compared to the general population (18). Secondly, individuals with ADHD who are detained in a prison are likely to be part of a subgroup of affected individuals whose functional capacity (as conceptualized by the WHO) is particularly impaired, through a combination of biological, social, personal, and environmental factors (48–50). It is thereby well-understood that people with ADHD who are detained suffer, for example, to a high degree from comorbidities (14, 51). Existing symptoms and impairments may thus initially appear to be more pronounced, especially against the backdrop of the highly structured and demanding prison environment with strict schedules, little flexibility and few possibilities to apply self-developed skills and compensation strategies, such as motoric (increased physical activity) or organizational strategies (delegation of tasks, use of electronic devices) (37). Executive function deficits may thus be easier to recognize even for laypersons with limited training (52). Further, it is conceivable that other neurodevelopmental disorders (NDD), such as Fetal Alcohol Syndrome (FAS) and Autism spectrum disorder (ASD), which still receive little attention in the Swiss correctional system and have a substantial rate of overlap, are currently being (mis-) labeled as "ADHD" by staff (11, 53, 54).

With regard to a previous study among the general population from neighboring Germany, it can be said that our qualitative findings complement quantitative results. Speerforck et al. reported recently that more than 90% of the German general population had heard of the terms "attention deficit hyperactivity disorder" or "ADHD," and 77% of those believed adult ADHD to be a real disease (55). In addition, a study from the USA concluded that 78% of those who had heard of ADHD believed it to be a real disease, with women and individuals with a higher socioeconomic background most often endorsing this belief (56).

Apart from the general awareness and a shared belief that ADHD is a "real disease," prison staff were under the impression that there was a lack of reliability in assessment of ADHD by experts, especially in respect to the threshold for initiation of pharmaceutical treatment. Furthermore, participants labeled ADHD as a particular "fashionable" diagnosis, i.e., as a disorder that is "popular" for mental health experts to diagnose or for patients to receive. Repeated statements that "behavioral abnormalities were socially more acceptable in the past" and that today "it is simply a matter of making a diagnosis" can also be regarded as indicative for the belief that ADHD is inappropriately mis- and overdiagnosed. Although, according to the knowledge of the authors, there are no studies that have investigated this phenomenon quantitatively or qualitatively among prison staff, quantitative studies among other populations show that this belief is widespread. For example, a survey of Australian general public attitudes toward the acceptability of pharmaceutical treatment for ADHD found that 78% of participants held the belief that individuals are diagnosed with ADHD when they do not actually have the disorder, a stark contrast to current evidence indicating that the majority of patients are underdiagnosed and undertreated (57–59). Still, diagnosis of ADHD remains up to now a clinical judgement, which needs to be based on a careful and detailed evaluation of a lifetime history of symptoms and functional impairments, commonly relying on the use of semi-structured diagnostic interviews that have not necessarily been validated for prison populations (60). While these semi structured instruments, such as the Diagnostic Interview for ADHD in adults (DIVA 2.0) or the Conners' Adult ADHD Diagnostic Interview for DSM-IV (CAADID) have been deemed to be reliable tools with acceptable psychometric properties for assessing and diagnosing adult ADHD, diagnosing ADHD in juvenile and adult offenders in a prison setting can be even more challenging because of frequent co-morbid disorders, limited access to collateral information and an overall lack of necessary resources (21, 61).

Given the perception that ADHD is a "fashionable diagnosis" and a convenient social label, it was surprising that prison staff favored hereditary-genetic or biological explanatory models for the development of ADHD. Environmental and social-cultural models revolving around external factors such as parental and familial stressors, social pressure and critical life events or disproportionate use of computer and communication devices played a lesser role in this sample. Mystical explanatory models were a rarity. The strong emphasis on the biological component found in this sample is also surprising in comparison to other studies investigating explanatory models for ADHD. For example, a study among general practitioners, i.e., a far more specialized clientele, identified factors which were mainly social, parental, environmental but much less hereditary-genetic or

biological in character (62). A representative population survey in Germany ($N = 1{,}008$) reported stressful life events, a pressure to perform and problems with parents or family as the top ranked causal beliefs among the German general population for adult ADHD (55). Furthermore, the authors of this study reported that those individuals who favored a "biogenetic" explanatory model were more open toward treatment by a psychiatrist, psychotherapist and the use of medication (55). There were some indications that these assertions held true in our sample of prison staff as well. However, even those who had adopted hereditary-genetic or biological explanatory models and were in favor of some form of treatment intervention (see below), viewed psychotherapy as the first and pharmaceutical interventions only as a second line or last resort treatment.

Apart from the variance in explanatory models, it became apparent that prison staff, irrespective of professional background, generally viewed inmates with ADHD rather negatively, as complicating correctional efforts on an individual level and for inmates collectively. A recurring motive in this context was that these types of inmate are always "standing out and sticking out," are quickly frustrated, verbally aggressive, disorganized and violating prison rules. More positive descriptions and attributions that can be found especially in lay literature, such as ADHD as a "gift" and as a disorder related to an increase in "creativity, ingenuity, spontaneity and brightness" were almost absent and largely uncommon (63, 64). This may be due to the fact that such attributes are generally not in demand and often perceived as counterproductive in a correctional environment (65).

In the literature there is some anecdotal evidence that inmates with ADHD may become model prisoners during times of incarceration, as it is believed that they benefit from highly structured surroundings (19, 66). Such assertations were not made by the staff we interviewed for this study, although some of the affected offenders had achieved a comparatively high level of functioning. Rather, a majority of prison staff were under the impression that inmates with ADHD more often came into conflict and confrontation with other prisoners. While this is in line with earlier reports from Young et al., who found that inmates with ADHD are six times more likely to engage in physical confrontations with other detainees, for example, as a result of impulsivity deficits leading to verbal and physical aggression, the statements of some interviewees in the present study show a more detailed understanding of which impairments associated with ADHD increase the likelihood of involvement in critical incidents. For example, it was repeatedly stated by staff that excessive talking and the need for lengthy explanations tied up time that was not available to other detainees and thus gave rise to frustrations among them. Indeed, there is an abundance of literature linking ADHD and difficulties in pragmatic aspects of communication, such as speaking without thinking, interrupting others' speech or conversations and talking excessively (67, 68). Additionally inattentive symptoms have been linked with language comprehension difficulties, a factor that often is perceived "as not listening or following instructions" (69). It seems plausible that these impairments and the resulting difficulties create additional tension between inmates, especially when one considers that prison staff voiced the opinion that inmates with ADHD are not perceived as mentally ill by fellow inmates and behavioral abnormalities are less accepted than, e.g., in those suffering from more obviously debilitating mental disorders such as psychosis. This may be an advantage and a disadvantage at the same time. Research on stigma in prison suggests that people in detention labeled as "mentally ill" are at an increased risk of being victimized by offenders who have not been labeled that way and therefore appear to be of lower hierarchic rank (70). Inmates with ADHD might therefore not be affected by such direct forms of stigmatization and victimization. This should be a topic of further research. However, disorder-related difficulties are not perceived as such, which is why other inmates show no understanding when breaking prison rules due to symptoms of hyperactivity, impulsivity or inattention is not sanctioned by staff, even if certain members of prison staff are aware of "cause and effect" in relation to ADHD. A recurring motif was that inmates with ADHD are more often exposed to disciplinary sanctions, especially in one of its most controversial forms, i.e., placement in solitary confinement (71, 72). From their statements in the present study it could be inferred that prison staff had experienced negative consequences of this form of punishment first hand and believed it to be "counterproductive" especially in offenders with ADHD. At the same time, correctional officers were generally of the opinion that this form of disciplinary sanction was "necessary to ensure equal treatment," contrasting starkly with current evidence and available alternatives (73, 74). Even though the specific details of solitary confinement differ significantly between jurisdictions, and its duration as a disciplinary sanction is generally limited on a cantonal level in Switzerland to days, future research should review this aspect not only from a medical-ethical, but also from a legal perspective, because some statements in the current study suggest that solitary confinement is imposed on offenders with ADHD even for smaller infractions such as verbal insults and may last up to weeks (75, 76). Furthermore, it could be argued that confining, restricting and limiting movement and exercise for 23 h a day for individuals with ADHD can be considered inhuman and ill treatment or even a kind of "double-jeopardy" because it has repeatedly been shown that physical activity mitigates ADHD symptoms, increases cognitive performance, improves executive function and helps those affected to manage behavioral symptoms (77–80). Thus physical activity can be considered a self-prescribed compensation mechanism, that is often recognized as a "skill" by those affected and is one of the few currently accessible treatment options for adults with ADHD in a correctional setting (37). Other authors have repeatedly called for the implementation of ADHD awareness training and workshops in the correctional system (21). In light of our findings, it may be useful during the development of such courses to consider including material and evidence on the adverse effects of solitary confinement on offenders with ADHD, to which prison staff may be able to relate, based on their own experiences.

It should not go unmentioned that, in the opinion of prison staff, detained individuals with ADHD required a specific form of "management" or "treatment" in everyday prison life and had

identified a variety of interventions that they deemed useful, such as coaching, providing structure, positive reinforcement, time, and support. This observation underscores that prison staff might be valuable for providing one-on-one skill-building sessions for inmates with ADHD, once adequately trained (21). However, in line with existing literature on general public attitudes toward the acceptability of behavioral and pharmacological treatments for ADHD, prison staff perceived psycho-social interventions, behavioral measures and cognitive training as more acceptable than medication (56, 81, 82). Non-pharmacological interventions were preferred by staff because they were believed to be efficacious, resulting in sustainable improvements, and were considered to be free of adverse effects—underlining the gap between evidence on efficacy of non-pharmacological treatment and the impact of adverse events associated with non-pharmacological treatments of ADHD and public opinion (83). The skepticism toward pharmacological treatment remained, even when interviewees' described benefits from stimulant medication and viewed inmates in treatment as more stable, easier to live with and better manageable. Previously it has been reported that these reservations may reflect diffuse fears of possible side effects or stigma that are not easily modified or corrected (84). Interestingly, this skepticism was not the result of negative experiences with the misuse and diversion of stimulants as outlined by Burns et al. (25), but reflected perceptions more in line with that of the general population (55). In fact, none of the prison staff interviewed in this study spontaneously expressed any concern related to the top ten reasons described in detail in the introduction section. On the one hand, this could be due to positive experiences with the prescription of other highly regulated psychotropic substances such as methadone, buprenorphine but also diacetylmorphine (Heroin) to inmates suffering from opioid dependence in this correctional facility (85) (Liebrenz et al., under review). On the other hand, the risk of misuse and deviation of stimulants by inmates in treatment during times of incarceration might be overrated. In fact, recommendations for the restrictive use of stimulants in prison are rated at the lowest level of evidence quality, being based on clinical experience, descriptive studies, or reports of expert committees (24, 86). What little data exists on the deviation of stimulants by inmates with ADHD who are being treated for the disorder stems, to the authors' knowledge, primarily from the US, where standards, principles and conditions of detention differ not insignificantly from, for example, those jurisdictions that adhere to the European Prison Rules drawn up by the Council of Europe (87). However, even these figures seem encouraging from our perspective: for example, Appelbaum reported on 116 male inmates with ADHD from the Massachusetts state prison system treated with stimulants between 2005 through 2007 and found that 105 (90.5%) adhered to protocol and showed no misuse of stimulants or other medications (26). Since people living in detention are in many jurisdictions entitled to a standard of care equivalent to that accessible for those in the community, this data, in the authors' view, does not support the notion of generally prescribing stimulants "only after a failure of a complete trial of one or more non-stimulant agents," as suggested earlier (24).

Finally, the current standard of care in the form of a multimodal treatment for ADHD was, not surprisingly, unknown to the correctional staff interviewed in this study and remained unmentioned. This observation underlines the importance of disseminating information and knowledge on this disorder to employees of correctional facilities (21). Since almost all respondents experienced the care of detainees with ADHD as labor- and time-intensive, energy-consuming and generally exhausting, and had adopted the view that inmates suffering from this disorder were in need of specific interventions, support and treatment, we are cautiously optimistic that at least in comparable penal institutions, staff may be open to the implementation of non-pharmacological treatments, offender psychoeducation and psychological treatment programs such as Reasoning and Rehabilitation 2 ADHD (88). In order to develop the understanding and acceptance of stimulant treatment for inmates with ADHD, it might be helpful to point to the successes of other pharmaceutical treatments for mental disorders, which were once considered highly controversial, but are generally better accepted today by prison staff (22). In addition, public opinion also seems to be changing regarding the use of psychotropic medications in cases of mental illness, as recently pointed out by Angermeyer et al. who reported that attitudes toward pharmacological treatment have become noticeably more favorable over the last two decades (89).

LIMITATIONS

These results need to be considered within the limitations of the investigation. First, because this is a qualitatively driven, mixed methods design study based on a modified site-based approach with a gatekeeper to recruit participants, the findings on the staff's personal stance toward ADHD cannot be generalized beyond this study sample. However, with regard to the explanatory models identified, experiences with inmates previously diagnosed with ADHD and attitudes toward necessary intervention, the sample represents a group of prison staff with a diverse professional background, with multiple years of experience of working within a correctional system and at different stages of training as correctional officers. With such a composition, it is very likely that this sample is similar to those of other correctional facilities in Switzerland, especially since completed vocational training is a prerequisite for an application to work with justice authorities in most cantons, and specific correctional training courses are organized on a super-institutional level, for example, by the Swiss Center for Expertise in Prison and Probation (SCEPP). In addition, scores on the ATP scale suggest that this sample's general attitude toward offenders is comparable to those reported for correctional officers from other European jurisdictions and even some common law countries. Second, there are limitations associated with volunteer bias, to which most studies are also susceptible. In order to minimize possible bias of the gatekeeper in selecting participants, considerable effort was made to ensure recruitment of a sample that incorporated diversity, also in respect to interest in the research topic. As described in more detail above, study participation was carried out during regular

working hours and was also counted as full working time for participants. Only one of the potential participants contacted declined to participate. The barrier to participation for this potential participant, however, could not be determined. As a qualitatively driven mixed methods design study, this study was not driven by a theoretical framework. Future studies on this subject could, however, use the insights gained here to pursue more focused research. We also recognize that the results may in part be specific to the Swiss legal and penal system. Nevertheless, the literature indicates that some perceptions and views identified in this study, such as a lack of knowledge on multimodal treatment options for ADHD and the skepticism toward the use of stimulant medication, have also been reported from other countries. Our findings provide several relevant insights into views held by prison staff on ADHD as a mental disorder and on individuals living with this disorder while being detained. Most importantly, our findings are based on prison staff's own reports identifying a range of experiences. These findings were not limited to predefined experiences, as might occur in a survey-based research. Furthermore, a written survey might have increased the likelihood of socially desirable responses.

CONCLUSIONS

This research extends our understanding of members of prison staff's perceptions and explanatory models of ADHD, their experiences with inmates diagnosed with this highly prevalent neurodevelopmental disorder and their attitudes toward ADHD management during times of detention. Our results indicate that prison staff working with inmates during different stages of incarceration are aware of ADHD and its core symptomatology and believe it to a be "real disorder." Simultaneously, participants labeled ADHD as a particularly "fashionable" diagnosis and thought that ADHD was inappropriately mis- and overdiagnosed. Unlike other populations, this sample favored hereditary-genetic or biological explanatory models for the development of ADHD over environmental and social-cultural explanations. Irrespective of professional background, staff generally viewed inmates with ADHD rather negatively, as complicating correctional efforts both on an individual level and for inmates collectively, and had had the experience that they more often came into confrontation with other prisoners. While this is in line with earlier reports, our findings suggest that this is not only due to physical aggression, but also to difficulties in pragmatic aspects of communication. It seems plausible that these impairments create additional tension between inmates, especially when one considers that prison staff voiced the opinion that inmates with ADHD are not perceived as mentally ill by fellow inmates. A recurring theme in the context was that inmates with ADHD are more often exposed to disciplinary sanctions, especially in one of their most controversial forms, namely placement in solitary confinement. While prison staff had experienced negative consequences of this form of punishment and believed it to be "counterproductive," they deemed it to be "necessary to ensure equal treatment," contrasting starkly with current evidence. In light of our findings, it may be useful during development of ADHD awareness courses to consider including material on the adverse effects of solitary confinement. It should not go unmentioned that, in the opinion of prison staff, detained individuals with ADHD required a specific form of "management" or "treatment" in everyday prison life. Non-pharmacological interventions were preferred because they were believed to be efficacious and were considered to be free of adverse effects—underlining the gap between evidence and public opinion. The skepticism toward pharmacological treatment remained, even when interviewees described benefits from stimulant medication and viewed inmates in treatment as more easily manageable. Interestingly, this was not the result of negative experiences with the misuse and diversion of stimulants, which was not reported. We are cautiously optimistic that at least in comparable penal institutions, staff may be open to the implementation of non-pharmacological treatments. In order to develop the acceptance of stimulant treatment for inmates with ADHD, it might be helpful to point to the successes of other pharmaceutical treatments for mental disorders that were once considered highly controversial, but are generally better accepted today by prison staff.

DATA AVAILABILITY STATEMENT

Excerpts of the transcripts relevant to the study are available on substantiated request from the corresponding author. Requests to access the datasets should be directed to Anna.Buadze@puk.zh.ch.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the research was conducted in accordance with the 1964 Helsinki Declaration and was authorized by the independent ethics committee (IEC) of the faculty of Human Sciences of the University of Bern. All participants were assured confidentiality, and gave their written informed consent to participate in the study and, specifically, to digital recording of the interviews. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

AB and NF: data gathering, evaluation of data. NF: development of topic guide, obtaining ethical approval. RS, SY, and AS: writing, revisions. AB and ML: conception, development of topic guide, evaluation of data, writing manuscript, revisions.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2020.600005/full#supplementary-material

REFERENCES

1. De Graaf R, Kessler RC, Fayyad J, ten Have M, Alonso J. The prevalence and effects of adult attention-deficit/hyperactivity disorder (ADHD) on the performance of workers: results from the WHO World Mental Health Survey Initiative. *Occupat Environ Med.* (2008) 65:835–42. doi: 10.1136/oem.2007.038448
2. Faraone SV, Biederman J, Spencer T, Wilens T, Seidman LJ, Mick E, et al. Attention-deficit/hyperactivity disorder in adults: an overview. *Biol Psychiatr.* (2000) 48:9–20. doi: 10.1016/S0006-3223(00)00889-1
3. Wilens TE, Faraone SV, Biederman J. Attention-deficit/hyperactivity disorder in adults. *JAMA.* (2004) 292:619–23. doi: 10.1001/jama.292.5.619
4. Bernardi S, Faraone SV, Cortese S, Kerridge BT, Pallanti S. The lifetime impact of attention deficit hyperactivity disorder: results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *Psychol Med.* (2012) 42:875–87. doi: 10.1017/S003329171100153X
5. Gjervan B, Torgersen T, Nordahl HM, Rasmussen K. Functional impairment and occupational outcome in adults with ADHD. *J Attention Disord.* (2012) 16:544–52. doi: 10.1177/1087054711413074
6. Volkow ND, Swanson JM. Adult attention deficit–hyperactivity disorder. *N Engl J Med.* (2013) 369:1935–44. doi: 10.1056/NEJMcp1212625
7. Biederman J, Faraone SV. The effects of attention-deficit/hyperactivity disorder on employment and household income. *MedGenMed*. (2006) 8:12.
8. Chang Z, Lichtenstein P, D'Onofrio BM, Sjölander A, Larsson H. Serious transport accidents in adults with attention-deficit/hyperactivity disorder and the effect of medication: a population-based study. *JAMA Psychiatr.* (2014) 71:319–25. doi: 10.1001/jamapsychiatry.2013.4174
9. Fletcher J, Wolfe B. Long-term consequences of childhood ADHD on criminal activities. *J Mental Health Policy Econ.* (2009) 12:119. doi: 10.2139/ssrn.1489147
10. Murphy K, Barkley RA. Attention deficit hyperactivity disorder adults: comorbidities and adaptive impairments. *Comprehen Psychiatr.* (1996) 37:393–401. doi: 10.1016/S0010-440X(96)90022-X
11. Billstedt E, Anckarsäter H, Wallinius M, Hofvander B. Neurodevelopmental disorders in young violent offenders: overlap and background characteristics. *Psychiatr Res.* (2017) 252:234–41. doi: 10.1016/j.psychres.2017.03.004
12. Edvinsson D, Bingefors K, Lindström E, Lewander T. ADHD-related symptoms among adults in out-patient psychiatry and female prison inmates as compared with the general population. *Upsala J Med Sci.* (2010) 115:30–40. doi: 10.3109/03009730903532333
13. Rasmussen K, Almvik R, Levander S. Attention deficit hyperactivity disorder, reading disability, and personality disorders in a prison population. *J Am Acad Psychiatry Law*. (2001) 29:186–93.
14. Rösler M, Retz W, Retz-Junginger P, Hengesch G, Schneider M, Supprian T, et al. Prevalence of attention deficit–/hyperactivity disorder (ADHD) and comorbid disorders in young male prison inmates. *Eur Arch Psychiatr Clin Neurosci.* (2004) 254:365–71. doi: 10.1007/s00406-004-0516-z
15. Baggio S, Fructuoso A, Guimaraes M, Fois E, Golay D, Heller P, et al. Prevalence of attention deficit hyperactivity disorder in detention settings: a systematic review and meta-analysis. *Front Psychiatr.* (2018) 9:331. doi: 10.3389/fpsyt.2018.00331
16. Eme R, Young S. Reliability of ADHD in prison populations: a response to Murphy and Appelbaum. *The ADHD Report.* (2017) 25:1–6. doi: 10.1521/adhd.2017.25.5.1
17. Murphy K, Appelbaum K. How reliable are prevalence rates of ADHD in prisons? *ADHD Report.* (2017) 25:1–5. doi: 10.1521/adhd.2017.25.2.1
18. Young S, Moss D, Sedgwick O, Fridman M, Hodgkins P. A meta-analysis of the prevalence of attention deficit hyperactivity disorder in incarcerated populations. *Psychol Med.* (2015) 45:247–58. doi: 10.1017/S0033291714000762
19. Berryessa CM. Attention, reward, and inhibition: symptomatic features of ADHD and issues for offenders in the criminal justice system. *ADHD Attention Deficit Hyperact Disord.* (2017) 9:5–10. doi: 10.1007/s12402-016-0203-8
20. Hall RC, Myers WC. Challenges and limitations to treating ADHD in incarcerated populations. *J Am Acad Psychiatry Law*. (2016) 44:164–70.
21. Young S, Gudjonsson G, Chitsabesan P, Colley B, Farrag E, Forrester A, et al. Identification and treatment of offenders with attention-deficit/hyperactivity disorder in the prison population: a practical approach based upon expert consensus. *BMC Psychiatr.* (2018) 18:281. doi: 10.1186/s12888-018-1858-9
22. Buadze A, Baggio S, Schleifer R, Aeberhard E, Wolff H, Schneeberger AR, et al. The accessibility of opioid agonist treatment and its forced discontinuation in swiss prisons—attitudes, perceptions and experiences of defense lawyers in dealing with detained persons using opioids. *Front Psychiatr.* (2020) 11:395. doi: 10.3389/fpsyt.2020.00395
23. Hirsch O, Chavanon M, Riechmann E, Christiansen H. Emotional dysregulation is a primary symptom in adult attention-deficit/hyperactivity disorder (ADHD). *J Affect Disord.* (2018) 232:41–7. doi: 10.1016/j.jad.2018.02.007
24. Appelbaum KL. Attention deficit hyperactivity disorder in prison: a treatment protocol. *J Am Acad Psychiatr Law Online.* (2009) 37:45–9.
25. Burns KA. Commentary: The top ten reasons to limit prescription of controlled substances in prisons. *J Am Acad Psychiatr Law Online.* (2009) 37:50–2.
26. Appelbaum KL. Stimulant use under a prison treatment protocol for attention-deficit/hyperactivity disorder. *J Correctional Health Care.* (2011) 17:218–25. doi: 10.1177/1078345811401356
27. Lichtenstein P, Halldner L, Zetterqvist J, Sjölander A, Serlachius E, Fazel S, et al. Medication for attention deficit–hyperactivity disorder and criminality. *N Engl J Med.* (2012) 367:2006–14. doi: 10.1056/NEJMoa1203241
28. Appelbaum KL, Hickey JM, Packer I. The role of correctional officers in multidisciplinary mental health care in prisons. *Psychiatric Serv.* (2001) 52:1343–7. doi: 10.1176/appi.ps.52.10.1343
29. Matheson L, Asherson P, Wong ICK, Hodgkins P, Setyawan J, Sasane R, et al. Adult ADHD patient experiences of impairment, service provision and clinical management in England: a qualitative study. *BMC Health Services Res.* (2013) 13:184. doi: 10.1186/1472-6963-13-184
30. Russell AE, Moore DA, Ford T. Educational practitioners' beliefs and conceptualisation about the cause of ADHD: a qualitative study. *Emot Behav Difficult.* (2016) 21:101–8. doi: 10.1080/13632752.2016.1139297
31. Hesse-Biber S. Qualitative approaches to mixed methods practice. *Qualitat Inquiry.* (2010) 16:455–68. doi: 10.1177/1077800410364611
32. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care.* (2007) 19:349–57. doi: 10.1093/intqhc/mzm042
33. Lindlof TR, Taylor BC. *Qualitative Communication Research Methods*. Sage publications (2017).
34. Arcury TA, Quandt SA. Participant recruitment for qualitative research: a site-based approach to community research in complex societies. *Human Organizat.* (1999) 128–33. doi: 10.17730/humo.58.2.t5g838w7u1761868
35. Buadze A, Stohler R, Schulze B, Schaub M, Liebrenz M. Do patients think cannabis causes schizophrenia?-A qualitative study on the causal beliefs of cannabis using patients with schizophrenia. *Harm Reduct J.* (2010) 7:22. doi: 10.1186/1477-7517-7-22
36. Canela C, Buadze A, Dube A, Eich D, Liebrenz M. Attitudes toward stimulant treatment of offspring of adult patients with attention-deficit/hyperactivity disorder. *J Child Adolescent Psychopharmacol.* (2017) 27:422–8. doi: 10.1089/cap.2016.0197
37. Canela C, Buadze A, Dube A, Eich D, Liebrenz M. Skills and compensation strategies in adult ADHD–A qualitative study. *PLoS ONE.* (2017) 12:e0184964. doi: 10.1371/journal.pone.0184964
38. Canela C, Buadze A, Dube A, Jackowski C, Pude I, Nellen R, et al. How do legal experts cope with medical reports and forensic evidence? The experiences, perceptions, and narratives of swiss judges and other legal experts. *Front Psychiatr.* (2019) 10:18. doi: 10.3389/fpsyt.2019.00018
39. Callahan L. Correctional officer attitudes toward inmates with mental disorders. *Int J Forensic Mental Health.* (2004) 3:37–54. doi: 10.1080/14999013.2004.10471195
40. Melvin KB, Gramling LK, Gardner WM. A scale to measure attitudes toward prisoners. *Crim Just Behav.* (1985) 12:241–53. doi: 10.1177/0093854885012002006
41. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Informat.* (2009) 42:377–81. doi: 10.1016/j.jbi.2008.08.010

42. Kaefer F, Roper J, Sinha PN. *A Software-Assisted Qualitative Content Analysis of News Articles: Examples and Reflections* (2015).
43. Rohrer L, Trampusch C. Continuity and change in the Swiss vocational training system. *Christine Trampusch and André Mach, Switzerland in Europe, Europe in Switzerland. Continuity and Change in the Swiss Political Economy*. London: Routledge (2011). p. 144–61. doi: 10.4324/9780203829394
44. Hogue TE. *Attitudes Towards Prisoners and Sexual Offenders*. Issues in Criminological and Legal Psychology (1993).
45. Kjelsberg E, Skoglund TH, Rustad, A.-B. Attitudes towards prisoners, as reported by prison inmates, prison employees and college students. *BMC Public Health.* (2007) 7:71. doi: 10.1186/1471-2458-7-71
46. Whitman JQ. *Harsh Justice: Criminal Punishment and the Widening Divide Between America*. Europe: Oxford University Press (2003).
47. Kury H. Fink, Daniel, Freiheitsentzug in der Schweiz. *Formen, Effizienz, Bedeutung. Monatsschrift für Kriminologie und Strafrechtsreform.* (2019) 102:169–72. doi: 10.1515/mks-2019-2013
48. Bölte S, Mahdi S, Coghill D, Gau SSF, Granlund M, Holtmann M, et al. Standardised assessment of functioning in ADHD: consensus on the ICF Core Sets for ADHD. *Eur Child Adolescent Psychiatr.* (2018) 27:1261–81. doi: 10.1007/s00787-018-1119-y
49. Mahdi S, Ronzano N, Knüppel A, Dias JC, Albdah A, Chien-Ho L, et al. An international clinical study of ability and disability in ADHD using the WHO-ICF framework. *Eur Child Adolescent Psychiatr.* (2018) 27:1305–19. doi: 10.1007/s00787-018-1124-1
50. Young S, Gudjonsson GH, Wells J, Asherson P, Theobald D, Oliver B, et al. Attention deficit hyperactivity disorder and critical incidents in a Scottish prison population. *Personal Individual Diff.* (2009) 46:265–9. doi: 10.1016/j.paid.2008.10.003
51. Rösler M, Retz W, Yaqoobi K, Burg E, Retz-Junginger P. Attention deficit/hyperactivity disorder in female offenders: prevalence, psychiatric comorbidity and psychosocial implications. *Eur Arch Psychiatr Clin Neurosci.* (2009) 259:98–105. doi: 10.1007/s00406-008-0841-8
52. Brown TE. ADD/ADHD and impaired executive function in clinical practice. *Curr Attention Disord Rep.* (2009) 1:37–41. doi: 10.1007/s12618-009-0006-3
53. Popova S, Lange S, Bekmuradov D, Mihic A, Rehm J. Fetal alcohol spectrum disorder prevalence estimates in correctional systems: a systematic literature review. *Can J Public Health.* (2011) 102:336–40. doi: 10.1007/BF03404172
54. Young S, González RA, Mullens H, Mutch L, Malet-Lambert I, Gudjonsson GH. Neurodevelopmental disorders in prison inmates: comorbidity and combined associations with psychiatric symptoms and behavioural disturbance. *Psychiatr Res.* (2018) 261:109–15. doi: 10.1016/j.psychres.2017.12.036
55. Speerforck S, Hertel J, Stolzenburg S, Grabe HJ, Carta MG, Angermeyer MC, et al. Attention deficit hyperactivity disorder in children and adults: a population survey on public beliefs. *J Attention Disord.* (2019) 2019:1087054719855691. doi: 10.1177/1087054719855691. [Epub ahead of print].
56. McLeod JD, Fettes DL, Jensen PS, Pescosolido BA, Martin JK. Public knowledge, beliefs, and treatment preferences concerning attention-deficit hyperactivity disorder. *Psychiatr Serv.* (2007) 58:626–31. doi: 10.1176/ps.2007.58.5.626
57. Ginsberg Y, Quintero J, Anand E, Casillas M, Upadhyaya HP. Underdiagnosis of attention-deficit/hyperactivity disorder in adult patients: a review of the literature. *Primary Care Companion CNS Disord.* (2014) 16:PCC.13r01600. doi: 10.4088/PCC.13r01600
58. Hamed AM, Kauer AJ, Stevens HE. Why the diagnosis of attention deficit hyperactivity disorder matters. *Front Psychiatr.* (2015) 6:168. doi: 10.3389/fpsyt.2015.00168
59. Partridge B, Lucke J, Hall W. Over-diagnosed and over-treated: a survey of Australian public attitudes towards the acceptability of drug treatment for depression and ADHD. *BMC Psychiatr.* (2014) 14:74. doi: 10.1186/1471-244X-14-74
60. Kooij J, Bijlenga D, Salerno L, Jaeschke R, Bitter I, Balazs J, et al. Updated European Consensus statement on diagnosis and treatment of adult ADHD. *Eur Psychiatr.* (2019) 56:14–34. doi: 10.1016/j.eurpsy.2018.11.001
61. Ramos-Quiroga JA, Nasillo V, Richarte V, Corrales M, Palma F, Ibáñez P, et al. Criteria and concurrent validity of DIVA 2.0: a semi-structured diagnostic interview for adult ADHD. *J Attention Disord.* (2019) 23:1126–35. doi: 10.1177/1087054716646451
62. Shaw K, Wagner I, Eastwood H, Mitchell G. A qualitative study of Australian GPs' attitudes and practices in the diagnosis and management of attention-deficit/hyperactivity disorder (ADHD). *Family Practice.* (2003) 20:129–34. doi: 10.1093/fampra/20.2.129
63. Armstrong T. *Neurodiversity: Discovering the Extraordinary Gifts of Autism, ADHD, Dyslexia, and Other Brain Differences*. ReadHowYouWant.com (2010).
64. Coghill D. Attention-deficit hyperactivity disorder: Should we believe the mass media or peer-reviewed literature? *Psychiatr Bull.* (2005) 29:288–91. doi: 10.1192/pb.29.8.288
65. Duguid S. *Can Prisons Work?: The Prisoner as Object and Subject in Modern Corrections*. Toronto; Buffalo; London: University of Toronto Press (2000). Retrieved from: http://www.jstor.org/stable/10.3138/9781442671676 (accessed December 14, 2020).
66. Hurley PJ, Eme R. *ADHD and the Criminal Justice System: Spinning Out of control*. BookSurge North Charleston (2004).
67. Bellani M, Moretti A, Perlini C, Brambilla P. Language disturbances in ADHEpidemiology D. *Psychiatr Sci.* (2011) 20:311–5. doi: 10.1017/S2045796011000527
68. Kim OH, Kaiser AP. Language characteristics of children with ADHD. *Commun Disord Quart.* (2000) 21:154–65. doi: 10.1177/152574010002100304
69. Baker L, Cantwell DP. Attention deficit disorder and speech/language disorders. *Compr Mental Health Care.* (1992) 2:3–16.
70. Edwards KA. Stigmatizing the stigmatized: a note on the mentally ill prison inmate. *Int J Offender Therapy Comparat Criminol.* (2000) 44:480–9. doi: 10.1177/0306624X00444006
71. Andersen HS, Sestoft D, Lillebæk T, Gabrielsen G, Hemmingsen R, Kramp P, et al. A longitudinal study of prisoners on remand: psychiatric prevalence, incidence and psychopathology in solitary vs. non-solitary confinement. *Acta Psychiatr Scand.* (2000) 102:19–25. doi: 10.1034/j.1600-0447.2000.102001019.x
72. Smith PS. The effects of solitary confinement on prison inmates: a brief history and review of the literature. *Crime Just.* (2006) 34:441–528. doi: 10.1086/500626
73. Glowa-Kollisch S, Kaba F, Waters A, Leung YJ, Ford E, Venters H, et al. From punishment to treatment: the "Clinical Alternative to Punitive Segregation"(CAPS) program in New York City jails. *Int J Environ Res Public Health.* (2016) 13:182. doi: 10.3390/ijerph13020182
74. Haney C. Restricting the use of solitary confinement. *Annual Rev Criminol.* (2018) 1:285–310. doi: 10.1146/annurev-criminol-032317-092326
75. Jositsch D, Ege G, Schwarzenegger C. *Strafrecht II: Strafen und Massnahmen* (9. *Zürcher Grundrisse des Strafrechts,* 2) (2018).
76. Künzli J, Frei NK, Spring A. *Einzelhaft in Hochsicherheitsabteilungen: Menschenrechtliche Standards und ihre Umsetzung in der* Schweiz, Gutachten zuhanden des Lenkungsausschusses (EDA/EJPD) des SKMR (2014).
77. Archer T, Kostrzewa RM. Physical exercise alleviates ADHD symptoms: regional deficits and development trajectory. *Neurotoxicity Res.* (2012) 21:195–209. doi: 10.1007/s12640-011-9260-0
78. Fritz KM, O'Connor PJ. Acute exercise improves mood and motivation in young men with ADHD symptoms. *Med Sci Sports Exerc.* (2016) 48:1153–60. doi: 10.1249/MSS.0000000000000864
79. Gapin JI, Labban JD, Etnier JL. The effects of physical activity on attention deficit hyperactivity disorder symptoms: the evidence. *Prevent Med.* (2011) 52:S70–4. doi: 10.1016/j.ypmed.2011.01.022
80. Suarez-Manzano S, Ruiz-Ariza A, De La Torre-Cruz M, Martinez-Lopez EJ. Acute and chronic effect of physical activity on cognition and behaviour in young people with ADHD: a systematic review of intervention studies. *Res Dev Disabil.* (2018) 77:12–23. doi: 10.1016/j.ridd.2018.03.015
81. Partridge B, Lucke J, Hall W. Public attitudes towards the acceptability of using drugs to treat depression and ADHAustralian D. *N Zealand J Psychiatr.* (2012) 46:958–65. doi: 10.1177/0004867412450755
82. Singh I. Boys will be boys: Fathers' perspectives on ADHD symptoms, diagnosis, drug treatment. *Harvard Rev Psychiatr.* (2003) 11:308–16. doi: 10.1080/714044393

83. NICE. *Attention Deficit Hyperactivity Disorder (update) [E] Evidence Review(s) for Efficacy of Nonpharmacological Treatment and the Impact of Adverse Events Associated With Nonpharmacological Treatments of ADHD*. (2018) Available online at: https://www.nice.org.uk/guidance/ng87/evidence/e-nonpharmacological-efficacy-and-adverse-events-pdf-4783686305
84. Krain AL, Kendall PC, Power TJ. The role of treatment acceptability in the initiation of treatment for ADHD. *J Attention Disord*. (2005) 9:425–34. doi: 10.1177/1087054705279996
85. Uchtenhagen A. Heroin-assisted treatment in Switzerland: a case study in policy change. *Addiction*. (2010) 105:29–37. doi: 10.1111/j.1360-0443.2009.02741.x
86. Murad MH, Asi N, Alsawas M, Alahdab F. New evidence pyramid. *BMJ Evid Based Med*. (2016) 21:125–7. doi: 10.1136/ebmed-2016-110401
87. Ministers C, c.o. E.C.o. *European Prison Rules: Council of Europe* (2006).
88. Young S, Ross R. *RandR2 for Youths and Adults With Mental Health Problems: A Prosocial Competence Training Program*. (2007) Ottawa: Cognitive Centre of Canada.
89. Angermeyer MC, Van der Auwera S, Matschinger H, Carta MG, Baumeister SE, Schomerus G. The public debate on psychotropic medication and changes in attitudes 1990–2011. *Eur Arch Psychiatr Clin Neurosci*. (2016) 266:165–72. doi: 10.1007/s00406-015-0660-7

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 05 May 2021
doi: 10.3389/fpsyt.2021.645927

Validity of Short-Term Assessment of Risk and Treatability in the Japanese Forensic Probation Service

Akiko Kikuchi, Takahiro Soshi, Toshiaki Kono, Mayuko Koyama and Chiyo Fujii*

Department of Community Mental Health and Law, National Institute of Mental Health, National Center of Neurology and Psychiatry, Tokyo, Japan

This study aimed to evaluate the predictive validity and reliability of the Short-Term Assessment of Risk and Treatability (START) in the context of the Japanese forensic probation service. START is a structured professional judgement guide for risk domains concerning negative behaviors such as violence, self-harm, suicide, substance abuse, unauthorized leave, victimization, and self-neglect. In this study, rehabilitation coordinators evaluated community-dwelling patients who were treated under the Medical Treatment and Supervision Act at baseline and followed-up for 6 months. The results revealed that START vulnerability scores significantly predicted self-harm, suicide, physical aggression, substance abuse, and self-neglect. START strength scores predicted physical violence and unauthorized leave. Specific risk estimates predicted physical violence and self-neglect. Risk judgement for future substance use may require adjustments for cultural differences, because of the lower prevalence in Japan. These results suggest that START offers a feasible and valid tool that allows clinicians to plan treatment and promote recovery of forensic patients in Japan.

Keywords: short-term assessment of risk and treatability (START), risk assessment, predictive validity, strength, structured professional judgement, forensic, outpatient

OPEN ACCESS

Edited by:
Thomas Masterman, Karolinska Institutet (KI), Sweden

Reviewed by:
Marije E. Keulen-de Vos, Forensic Psychiatric Center de Rooyse Wissel, Netherlands
Marc Graf, University Psychiatric Clinic Basel, Switzerland

****Correspondence:***
Akiko Kikuchi
okiku@b-star.jp

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: *24 December 2020*
Accepted: *06 April 2021*
Published: *05 May 2021*

Citation:
Kikuchi A, Soshi T, Kono T, Koyama M and Fujii C (2021) Validity of Short-Term Assessment of Risk and Treatability in the Japanese Forensic Probation Service. Front. Psychiatry 12:645927. doi: 10.3389/fpsyt.2021.645927

INTRODUCTION

Violence is not the only negative behavior in the prognosis of Mentally Disordered Offenders (MDOs). Suicide, self-harm, substance abuse, self-neglect, and victimization have all been found to occur at higher rates among psychiatric patients than among the general population (1–4). Risk management of these problem behaviors is a routine practice in psychiatry. Logically, risk management of such behaviors requires risk assessment tools for as many problem behaviors as there are. However, risk factors underlying different problem behaviors are known to overlap (5). A tool that can aggregate assessment items and assess the risk of worrisome outcomes for each patient would therefore be desirable.

The purpose of risk assessment in clinical practice is to guide treatment planning to support the recovery of the individual. One important perspective to support recovery in mental health is the focus on strength (6, 7). Focusing on strength has been shown to not only restore self-esteem and improve quality of life in subjects, but also improve social functioning and reduce risk behaviors (6). Strength is a protective factor that mitigates risk (8).

In the past decade, the interest in incorporating protective factors into the risk assessment and management of violence has been growing. Relevant clinical research has developed various

risk measures that include protective factors, such as the Short-Term Assessment of Risk and Treatability (START) (8, 9), Structured Assessment of Violence Risk in Youth (SAVRY) (10), and Structured Assessment of Protective Factors for Violence Risk (SAPROF) (11).

The START is a risk assessment guide for a series of negative outcomes in psychiatric patients, such as violence, self-harm, suicide, self-neglect, victimization, substance abuse, and unauthorized leave. *This guide was developed as a short-term risk assessment for people with mental illness, substance use, and personality disorders.* Unlike traditional vulnerability-focused approaches, START assesses empirically selected dynamic factors comprising both protective factors ("strengths") and risk factors ("vulnerabilities"), and judges the risk of seven negative outcomes occurring over a pre-determined period, as specific risk estimates (SREs). The negative outcomes of interest are: violence, self-harm, suicide, substance use, unauthorized leave, victimization, and self-neglect.

According to a systematic review of START, vulnerability score, strength score, and SREs have all been shown to have predictive validity for violent outcomes (12). With regard to outcomes other than violence, a meta-analysis suggested that although neither vulnerability nor strength scores predicted self-harm, the SRE for self-harm did offer predictive validity (12). Only one study has reported adequate predictive validities for unauthorized leave and substance use, although predictive validities for self-neglect and victimization were not significant (13).

Results from these previous studies were promising, but further evaluation may be necessary for at least two reasons. First, past studies of START were conducted in Western countries [e.g., Canada, Norway, Australia, the United Kingdom (UK), the United States, the Netherlands]. Cross-cultural generalization of START may be crucial to clarify whether the same risk and strength factors can predict negative outcomes in different cultures, such as Asian samples.

Second, most studies have examined the predictive validity of START in inpatient populations. For example, Nicholls et al. reported that case managers used START to assess patients in the community, but did not investigate its predictive validity (14). Another study tested the psychometric characteristics of START for 301 outpatient forensic psychiatric patients in the Netherlands (15). They found that for the 6-month follow-up, structured professional judgement ratings by the clinicians modestly improved the prediction of future violence beyond a summation of historical, vulnerability, and strength scores. To the best of our knowledge, no other studies have investigated the predictive validity of START in forensic outpatients.

In summary, research to date on the START has focused mainly on inpatients in Western countries. As START adopts a Structured Professional Judgement (SPJ) approach (16), the items were selected by a comprehensive review of the literature on risk factors for negative outcomes in psychiatric patients (8). Unlike actuarial risk assessments, item selection did not rely on a specific sample on which the assessment was developed. We thus expect that the predictive accuracy may be generalizable to other samples, such as Asian countries. To expand the literature on START, this study provides a first examination of the predictive validity of START in a Japanese forensic outpatient context.

MATERIALS AND METHODS

Study Design

This study comprised a 6-month prospective study of outpatients in the community in Japan under the "Act for the Medical Treatment and Supervision of Persons with Mental Disorders Who Caused Serious Harm," commonly called the "Medical Treatment and Supervision Act (MTSA)." The follow-up period of 6 months was selected for two reasons. First, a short term was required, as START was deliberately developed to assess short-term risk and treatability. Second, the period of follow-up had to be long enough for incidents to occur, as a past study showed that the rate of reoffending within 1 year after discharge was $< 3\%$ among MTSA patients (17), and cosiderably low rate. Therefore, it was assumed better to follow up for 6 months rather than three, in order to increase the chance of collecting negative incident data.

Setting

The MTSA in Japan is a forensic mental health act for Mentally Disordered Offenders (MDOs) who have committed murder, severe injury, arson, robbery, rape, or indecent assault under a state of insanity or diminished criminal responsibility. The act was passed by the parliament in 2003 and came into effect in 2005. When MDOs are introduced to the MTSA system and are mandated by the district court as warranting treatment under the MTSA, they are allocated to receive either an inpatient treatment order or an outpatient treatment order (18). The MTSA stipulates that the outpatient treatment order can last up to 3 years and be prolonged up to 5 years in total under special circumstances, but no longer. Past studies have found that the total cumulative rate of reoffending after discharge was 2.5% (1.1–3.9%) at 1 year and 7.5% (4.6–10.4%) at 3 years. The rate of serious reoffending was 0.4% (0.18–0.99%) at 1 year and 2.0% (0.4–3.6%) at 3 years (17).

Participants

Inclusion Criteria

Patients were included when they had been given an MTSA outpatient treatment order by the district court and were dwelling in the community.

Exclusion Criteria

Exclusion criteria were as follows:

1). If the outpatient treatment order was known to expire within 6 months. The maximum MTSA outpatient treatment order is 5 years. Therefore, for example, if a patients' outpatient treatment had exceeded 4.5 years, it was apparent that the outpatient treatment order would expire before 6 months.
2). When the patient was under an MTSA outpatient treatment order, but was hospitalized in a psychiatric unit under the Mental Health and Welfare Act at Time 1. The MTSA stipulates that patients can be hospitalized under the Mental Health and Welfare Act for regular psychiatric care while remaining under the MTSA outpatient treatment order.

Such patients were excluded from this study as their situation could not be considered to represent "living in the community."

Procedure

The START manual was translated into Japanese by the authors with formal written consent from the original authors. The first author had experience in the SPJ scheme and participated in a START workshop by the original authors prior to the beginning of the study.

Rehabilitation coordinators (RCs) were recruited in collaboration with the Mental Health Probation Planning Office in the Ministry of Justice. RCs are forensic probation officers who provide supervision and case management of MTSA patients. RCs regularly meet with MTSA patients, and hold care coordination meetings with the participation of related caregivers and agencies in the community. RCs gather information about the patient to monitor, supervise, and coordinate treatment efforts. RCs are responsible for collating any incident reports.

Those RCs who provided informed consent to participate in the study were provided with the Japanese START manual and received 1 day of training in scoring START. All training was provided by a clinical psychologist (first author). Training was conducted in eight regions regulated by the Regional Branch Bureau of Health and Welfare in Japan. After training, RCs were able to contact the first author for clarifications pertaining to the scoring of items in START. Only two of 102 RCs were trained in the use of any SPJ instrument prior to this study.

After START training, data collection was longitudinally implemented in two parts. At Time 1, RCs were asked to score the START of patients in their caseload who met the inclusion criteria for the study. RCs were required to use the START and estimate the risks of the seven negative outcomes during the 6 months subsequent to the assessment. Completed START summary sheets were then sent to the Mental Health Probation Planning Office. RCs were asked to maintain records of challenging behaviors from patients for the next 6 months as in routine practice. This information was to be posted to the problematic behavior form. At Time 2, 6 months after Time 1, RCs sent the problematic behavior forms to the Mental Health Probation Planning Office. All data sheets were anonymized in the Mental Health Probation Planning Office before being sent to the first author for analyses.

Measures

For each eligible patient, RCs completed START, and a sociodemographic face-sheet at Time 1, and the problematic behaviors form designed specifically for this study at Time 2.

Short-Term Assessment of Risk and Treatability (START)

Unlike traditional vulnerability-focused approaches, START assesses 20 empirically selected dynamic factors (**Table 1**) in terms of both protective factors (strengths) and risk factors (vulnerabilities). Raters can add up to two case-specific items. Protective and risk factors are rated independently on three levels: 0 = minimal or no vulnerability/strength; 1 = moderate vulnerability/strength; and 2 = high vulnerability/strength. The evaluator also identifies critical vulnerabilities and key strengths, signature risk signs, medical conditions, and histories of the seven negative outcomes. Finally, the evaluator rates the risk of each outcome occurring over a predetermined period on a scale of low, medium, and high. A rating of low risk indicates no or minimal risk, moderate indicates greater than average risk, and high indicates a relatively imminent and serious threat.

TABLE 1 | Items of the Short-Term Assessment of Risk and Treatability (START).

1.	Social skills
2.	Relationships
3.	Occupational
4.	Recreational
5.	Self-care
6.	Mental state
7.	Emotional state
8.	Substance use
9.	Impulse control
10.	External triggers
11.	Social support
12.	Material resources
13.	Attitudes
14.	Medication adherence
15.	Rule adherence
16.	Conduct
17.	Insight
18.	Plans
19.	Coping
20.	Treatability
21. and 22.	Case specific items

START has shown practical utility when incorporated into routine practice. Nicholls et al. (19) found excellent inter-rater reliability overall (intraclass correlation coefficient, ICC2 = 0.87, $p < 0.001$). Doyle et al. assessed START implementation, recruiting staff members of a medium secure forensic mental health service who had participated in the START training (20). They found that START took a mean of 25 min to complete, and 82.1% of assessments were completed in ≤ 30 min. Another study conducted in a UK medium secure hospital found that, by the second application of START, professionals were able to complete the assessment in 11.03 min (21). START was identified as a tool supporting best practice in managing violence as well as related risks among psychiatric patients in the UK (22).

This study excluded case-specific items from the analysis, because these were specific to individuals and not comparable between patients. Total scores on strength and vulnerability items were prorated to account for up to four missing items in accordance with the START manual (8). According to the recommendation in the START manual, assessments with more than five or more missing item data were excluded (8).

Problematic Behavior Data

Outcome measures were problematic behaviors exhibited by the patient. Data collection was operationalized by asking RCs to write down the problematic behaviors and then to categorize each event into one of the following: self-harm, suicide, physical violence, substance abuse, victimization, self-neglect, unauthorized leave, or other challenging behaviors (free description). Data for other challenging behaviors (e.g., water intoxication) were not included in this study.

Demographic and Clinical Data

Data on age, sex, diagnosis (International Classification of Diseases, 10th edition (ICD-10) (23), index offense, and length of MTSA outpatient treatment were collected at Time 1. The information in patient records were transferred into the dataset. The diagnoses were decided by certified psychiatrists who implemented the court-ordered mental health examination for 3 months. The ICD-10 system is used for MTSA diagnoses. The mental health examination report was submitted to the district court to be reviewed in the process of making decisions about the case. In rare instances where the main diagnosis is proven to be different during the MTSA treatment, the diagnosis is renewed accordingly in the official patient records.

Analyses

Receiver operating characteristic (ROC) analyses were used to examine the predictive validity of START Vulnerability and Strength scores, and SREs for the different challenging behavior incidents in the 6 months following the Time 1 evaluation. ROC analysis has been widely used in violence prediction research due to its independence from base rates (24). To quantify the ROC, area under the ROC curve (AUC) was calculated. Strength scores were inverted when conducting ROC analyses to compare predictive validity to the total vulnerability score and specific risk estimates. Spearman's rho between the START vulnerability score, strength score, and the number and type of problematic challenging behaviors was calculated. Cronbach's alpha was used to measure the internal consistency of START items. All analyses were conducted using SPSS version 21.0 software (IBM corporation, Armonk, NY).

RESULTS

Study Profile

In total, 102 RCs (57.6% of the total number of RCs in Japan at Time 1) were recruited to the study, of whom 18 were excluded owing to an absence of eligible patients in their caseload (**Figure 1**). At Time 1, a total of 235 START assessments were completed by 84 RCs. By Time 2, 6 months after initial assessment, two RCs declined to participate in the study, resulting in a decrease of six START assessments. Another START assessment was excluded due to a patient moving to another prefecture. As a result, 228 pairs of START assessment and problematic behavior forms were obtained. Based on the exclusion criterion of START assessments with more than five missing item scores, four patients were further excluded from the analysis based on recommendations in the START manual (8). Another 43 assessments were excluded as the client was hospitalized under the Mental Health and Welfare Act at Time 1. As a result, 181 pairs of START assessments from Time 1 and problematic behavior forms from Time 2, were analyzed in this study.

Sample Characteristics

Table 2 shows descriptive characteristics of the study. The 181 eligible study subjects comprised predominantly men (79%) with a mean age of 43 years (range 24–86 years). The most frequent ICD-10 diagnosis was F2, schizophrenia (n = 141; 77.9%). The second most frequent was F1 (n = 19; 10.5%), Mental and Behavioral Disorders due to Psychoactive Substance Use. Concerning the index offense, murder, injury, and arson made up to ∼90% of the total number. At Time 1, the average length of MTSA outpatient treatment was 14.46 months [standard deviation (SD) = 8.66 months]. Overall, the study sample did not significantly differ from the national MTSA sample in terms of distributions of gender, age at Time 1, diagnosis, or index offense (25).

START Scores

In 6 months, 42 patients (23.2%) showed at least one START negative outcome (**Table 3**). The most commonly observed negative outcome was self-neglect, in 24 patients (13.2%). The least common risk outcomes were self-harm and victimization [two patients (1.10%) each]. No participants were rated as high risk for victimization or unauthorized leave. Mean vulnerability score was 12.52 (SD = 7.40) and mean strength score was 23.55 (SD = 7.90). Vulnerability score correlated negatively with strength score (Spearman's rho = −0.55, $p < 0.01$).

Predictive Validity of START

Presence of Negative Outcomes

Table 4 shows the predictive accuracy (AUC) of baseline START assessment scores for problematic behaviors in the 6 months after scoring. An AUC > 0.71 was considered as a large effect, 0.64∼0.70 as medium, and 0.56∼0.63 as small (26).

The vulnerability score significantly predicted occurrences of self-harm (AUC = 0.95, $p = 0.03$), suicide (AUC = 0.83, $p < 0.01$), physical violence (AUC = 0.85, $p < 0.01$), and substance abuse (AUC = 0.78, $p < 0.01$) with a large effect size. Feedback from participating RCs revealed the difficulty of assessing the intent to die for a given suicide/self-harm event. We therefore produced a composite self-harm/suicide outcome and the AUC by vulnerability score was 0.86 ($n = 7$, $p < 0.01$).

The Strength score significantly predicted only the non-occurrence of physical violence (AUC = 0.82, $p < 0.01$) and unauthorized leave (AUC = 0.82, $p < 0.01$).

SREs significantly predicted self-harm (AUC = 0.98, $p < 0.05$) and physical violence (AUC = 0.79, $p < 0.01$) with a large effect size, and self-neglect with a medium effect size (AUC = 0.69, $p < 0.01$), but not suicide, substance abuse, victimization, or unauthorized leave.

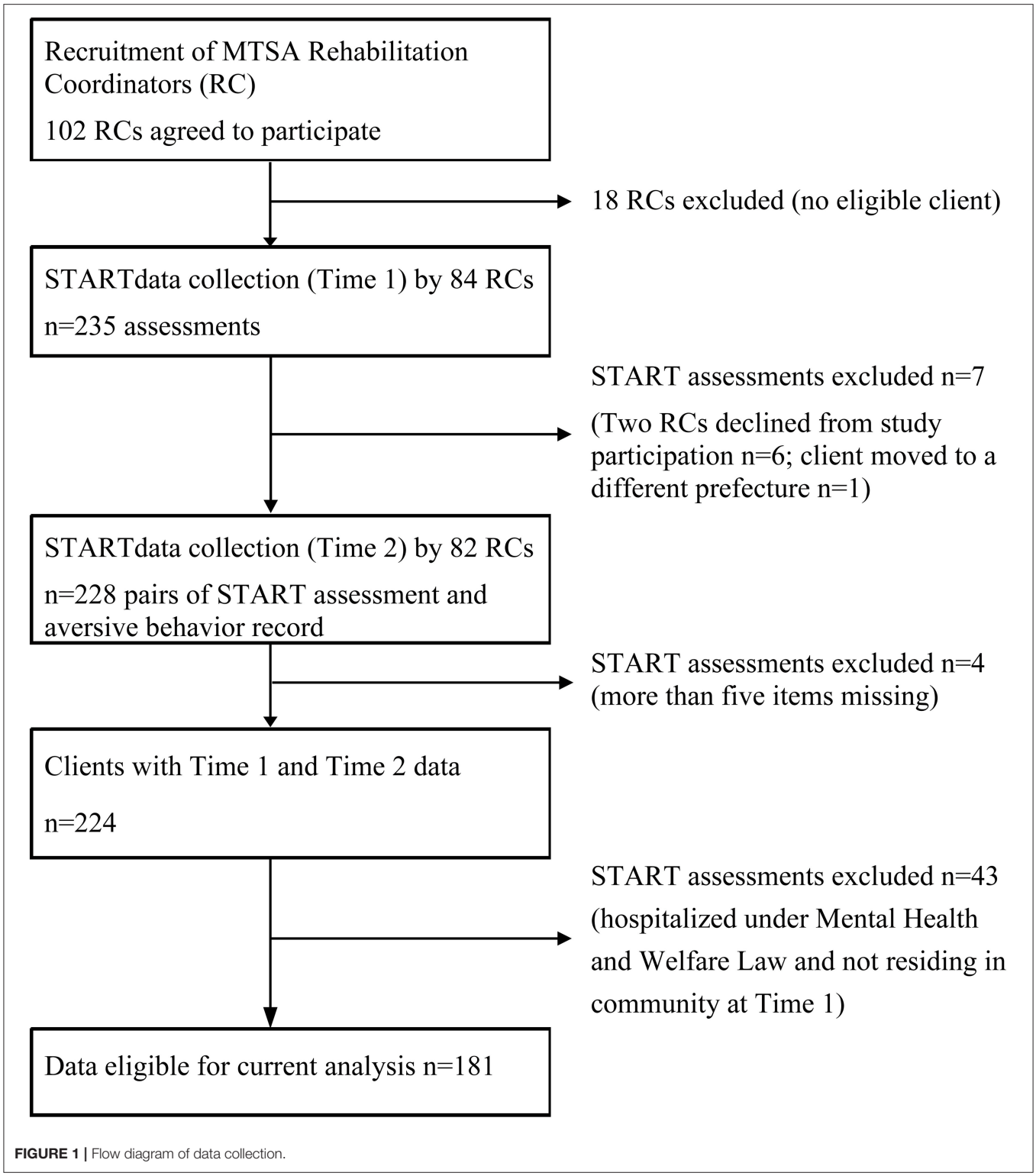


FIGURE 1 | Flow diagram of data collection.

Both vulnerability score and strength score were predictive of "any START negative outcomes" with a medium to large effect size (AUC = 0.74, $p < 0.01$ for vulnerability score; AUC = 0.67, $p < 0.01$ for strength score).

Total Number and Types of Incidents per Patient

Vulnerability score correlated significantly with total number of incidents (Spearman's rho = 0.34, $p < 0.01$) and total types of incidents (Spearman's rho = 0.37, $p < 0.01$). Strength score

also correlated significantly with the total number of incidents (Spearman's rho = −0.23, $p < 0.01$) and total types of incidents (Spearman's rho = −0.24, $p < 0.01$).

Internal Consistency

Cronbach's alpha for the standard 20 START items was 0.90 for vulnerability items and 0.91 for strength items.

TABLE 2 | Descriptive statistics at Time 1 ($n = 181$).

		n/Mean	%/SD
Gender	Male	143	79.00
	Female	38	21.00
Age (years)		42.75	12.51
Diagnosis (ICD-10)			
	F0	2	1.10
	F1	19	10.50
	F2	141	77.90
	F3	9	4.97
	F4	3	1.66
	F6	1	0.55
	F7	2	1.10
	F8	2	1.10
	G4	2	1.10
Index offense			
	Murder	58	32.0
	Injury	64	35.4
	Arson	42	23.2
	Robbery	7	3.9
	Rape	3	1.7
	Indecent assault	7	3.9
MTSA outpatient treatment (months)		14.46	8.66

F0, organic and symptomatic mental disorders; F1, mental and behavioral disorders due to psychoactive and other substance use; F2, schizophrenia, schizotypal, and delusional disorders; F3, mood or affective disorders; F4, neurotic, stress-related, and somatoform disorders; F6, disorders of adult personality and behavior; F7, mental retardation; F8, disorders of psychological development; G4, epilepsy and recurrent seizures.

DISCUSSION

This study appears to be the first to examine the validity of START in a prospective forensic sample living in the community and to explore the utility of START in Japan. Little research of this nature has been conducted outside North America and Europe.

Predictive Validity

Physical Violence

START vulnerability score, strength score, and specific risk estimates all showed significant and high predictive validity for physical violence in the 6-month follow-up period. Past studies have consistently found that START was predictive of physical violence in 3–12 months (12, 27–32). START risk/vulnerability items for judging physical violence risk may thus also be generalizable to MDOs in Japan.

Self-Harm/Suicide

Vulnerability score showed predictive validity for both self-harm and suicide within 6 months, whereas strength score did not. O'Shea et al. (33) analyzed the predictive validity of START in an inpatient setting by combining self-harm and suicide, because their outcome data were derived from progress notes with a flag "self-harm/suicide" (33). This may reflect the difficulty in terms of clinical reality for distinguishing between deliberate self-harm with no intent to die and attempted suicide with intention to die (34). If this is true in inpatient settings, it is reasonable to assume that the difficulty would be larger in the community, where direct observation of patients' behaviors is much lower.

Our results found significant and sufficient AUCs in a 6-month follow-up period for the combined item of self-harm/suicide. Bearing in mind the significant and persistent risk of suicide following deliberate self-harm (35), relaxing the intention criteria may be more feasible in clinical settings, to judge combined risk estimates for self-harm/suicide. This is particularly true where the treated population consists primarily of individuals with psychosis, since these individuals are approximately six times more likely to die by suicide after a prior incident of deliberate self-harm (36).

TABLE 3 | Distribution of negative outcomes and START risk estimates ($n = 181$).

	Negative outcomes				Specific risk estimates							
	Patient		Incident		Low		Moderate		High		Missing	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Self-harm	2	1.10	2	2.13	169	93.37	8	4.42	3	1.66	1	0.55
Suicide	7	3.87	9	9.57	159	87.85	17	9.39	3	1.66	2	1.10
Physical violence	6	3.31	19	20.2	155	85.64	23	12.71	3	1.66	2	1.10
Substance abuse	10	5.52	12	12.8	162	89.50	16	8.84	3	1.66	0	0
Victimization	2	1.10	2	2.13	166	91.71	15	8.29	0	0	0	0
Self-neglect	24	13.26	45	47.9	157	86.74	21	11.60	3	1.66	0	0
Unauthorized leave	4	2.21	5	5.32	171	94.48	10	5.52	0	0	0	0
Any START outcome	42	23.20	94	100								

TABLE 4 | Predictive accuracy (AUC) of baseline START assessment scores for problematic incidents in 6 months ($n = 181$).

	Vulnerability total		Strength total		Specific risk estimate	
	AUC	***p***	**AUC**	***p***	**AUC**	***p***
Self-harm	0.95*	0.029	0.64	0.51	0.98*	0.02
Suicide	0.83**	0.006	0.69	0.11	0.62	0.31
Physical violence	0.86**	0.001	0.82	0.007	0.79*	0.02
Substance abuse	0.78**	0.003	0.57	0.49	0.61	0.24
Victimization	0.72	0.28	0.75	0.22	0.46	0.84
Self-neglect	0.66*	0.012	0.61	0.094	0.69**	0.003
Unauthorized leave	0.78	0.056	0.83*	0.022	0.47	0.85
Any START outcome	0.74***	0.000	0.67**	0.001	N/A	N/A

The AUC for Strength total predicts absence of negative outcomes.
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Substance Abuse

Vulnerability scores, but not strength scores, were sufficiently predictive of substance abuse at 6 months. The vulnerability score outperformed the specific risk estimate for substance abuse. The distribution of risk estimates for substance use in this study was 162 patients with low risk (89.5%), 16 patients with medium risk (8.8%), and three patients with high risk (1.7%). However, actual incidents of substance abuse comprised nine cases (5%) in the 6-month follow-up period. This means that RCs tended to judge patients to be at a higher risk than they actual were (Fisher's exact test $p = 0.004$).

Past studies have documented that substance use tends to be a chronic condition where most patients need repeated treatment efforts (37). Therefore, when a patient is found to have a history of substance abuse, RCs might tend to consider and weigh this as evidence of elevated risk of further substance use. However, Japan has a low rate of drug use compared to other Western countries, such as the UK and European countries. For instance, according to a 2004 report from the World Health Organization, the 12-month prevalence of drug use disorders among male 15 years or older was 0.01% in Japan, markedly lower than the 1.29% in the UK and 1.14% in Canada (38). Our results suggest that the impact of historical substance use on future use may be mitigated in Japan because of the lower availability of drugs.

Making cultural adjustments when deciding on the impact of substance use may also be necessary for making clinical judgements regarding future violence in Japan. Past studies have repeatedly documented an effect of substance use on an elevated risk of violence in psychosis (39, 40). However, a recent study by Imai et al. (41) examined 420 Japanese patients with schizophrenia who had committed violent acts immediately prior to an emergency admission to a psychiatric hospital. Substance abuse and antisocial episodes were not recognized as significant violence-associated factors in that study. They speculated that this result was related to the markedly low rate of drug use in Japan (41). Taken together, evaluators in Japan should consider making cultural adjustments in weighing the impact of substance use when making clinical risk judgements. This is possible with START, which adopts an SPJ approach to risk assessment, where risks are estimated not by the total score, but by clinical judgements.

Unauthorized Leave

Inverted strength scores were predictive of future unauthorized leave, although vulnerability scores were not. This discrepancy could be attributed to the ambiguous definition of unauthorized leave in the community setting. For example, reported incidents have included temporary unauthorized leave (failing to report leaving) from a group home and unexplained disappearance for days where contact was impossible. Such instances of unauthorized leave may remain undetected in cases of independent living or when occurring between care coordination meetings.

Self-Neglect

Self-neglect was observed in 24 patients (13.3%), representing the most common START negative outcome in the study sample. Self-neglect was predicted by the vulnerability score and specific risk estimate, but not by the strength score. This was different from the observations of O'Shea et al. (12) who studied the predictive validity of START with inpatients and found neither vulnerability nor strength score predicted self-neglect. On the other hand, Marriott et al. reported different results that self-neglect in psychosis was predicted by both vulnerability score and strength score (42). As noted by Marriott et al. (42), the predictive validity of START for self-neglect may be influenced by the type of community setting. Our results may be reflective of Japanese MDOs residing in the community.

Victimization

Only two incidents (1.1%) of victimization were reported in our sample during the 6-month follow-up. Neither START vulnerability score nor strength score predicted their occurrence. These low rates can be interpreted as follows: The first is the underreporting of victimization. According to the International Crime Victims Survey by the United Nations Interregional Crime and Justice Research Institute in 2000, the yearly prevalence of victimization in 1999 was 15.2% in Japan (43). When also considering that victimization is higher for people with severe

mental illness than for the general population (44, 45), the extent of underreporting in our sample is apparent. The second interpretation is that the compulsory nature of MTSA outpatient treatment may have served to protect against supervision. This aligns with a review of the effects of compulsory community treatment by Kisely et al. (46), who found that people receiving compulsory community treatment were less likely to be victims of violent or non-violent crime. They speculated that the effect may be due to the intensity of treatment or its compulsory nature (46).

Total Number and Types of START Outcomes

One of the assumptions of START is that risks overlap between negative outcomes (8). Vulnerability score correlated significantly with total number and types of START negative outcomes. Among the 42 patients who exhibited at least one START negative outcome within 6 months, 14 patients (34.14%) exhibited two or more types of START negative outcomes, supporting the assumption that risks overlap.

Internal Consistency

Japanese versions of START items exhibited high internal consistency (>0.90), comparable to those in past Western studies (19, 27, 47).

Vulnerability and Strength Scores

The fact that strength scores only showed moderately significant correlations with vulnerability scores suggests that START strengths do not merely represent the vulnerability/risk measure repeated and expressed in the opposite direction. This differed from the results described by Abidin et al. (27), where START vulnerability and strength scores were strongly and inversely correlated ($r = -0.947$) (27).

Strength score showed predictive validity only for physical violence and unauthorized leave. This was much less than that for the vulnerability score, which showed predictive validity for five of the seven outcomes. Two reasons may play roles in this difference. First, the vagueness of some START strength items may originate from the "lack of conceptual certitude around the relationship between protective and risk factors" (48). This reasoning may be supported by previous findings that assessment tools with separate items and unambiguous definitions for protective factors, such as SAPROF and SAVRY, tend to perform better in demonstrating incremental validity (49–51). Second, strength scores may be more predictive of positive results, such as job attainment and personal recovery, than merely non-negative results such as absence of violence. Our results may thus indicate the clinical utility of strength items as more relevant than risk estimates in guiding treatment planning.

Limitations

This study shows several limitations that merit consideration when interpreting the results. First, inter-rater reliability was not determined in this study. All data were collected during the routine forensic probation practice of RCs, and it is not standard practice for MTSA patients to have two or more RCs in charge. Second, negative outcome data were collected from a single source, the RCs. Past studies have shown that detection of violence during follow-up increased steadily when combining methods (52). Our RCs obtained knowledge of forensic patients not only from direct contact with the patients in question, but also through care coordination meetings where multiple agencies and disciplines discuss the case. However, negative outcomes may still have been underreported. Aggression against psychiatric patients has been reported to show a tendency to be underreported (53), and the same conditions may have been present in the present study. This is important because the current study gathered outcome data for outpatients in the community, which is different from inpatient settings where outcome information is readily accessible and a strong obligation to record negative events is present. Future studies should ideally use collateral information on negative outcomes. Third, although the sample size of this study was the largest to date in validating risk assessment among forensic outpatients in Japan, the sample size was still too small to detect meaningful calculation of AUCs for victimization and unauthorized leave. Finally, although this study extended the evaluation of START to the outpatient population, the results remain limited to forensic psychiatric outpatients under MTSA in the community. The predictive validity of START in both forensic inpatients and general psychiatric patients in Japan remains unknown and is a target for future studies.

Conclusion

The present study has major implications in terms of the dissemination of START in forensic psychiatric practice in the community. We were able to demonstrate via a prospective study design that START is an assessment tool that can be applied in Japan, a non-Western country. To conclude, this study advances our understanding regarding the utilization of START by clinicians in planning treatment for patients that will not only reduce the risks of negative outcomes, but also enhance strengths to promote recovery in the community.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The study protocol was approved by the Ethics Committee of the National Center of Neurology and Psychiatry. All RCs provided written informed consent to participate in the research. Patients were notified of the study by posters in local probation offices and were guaranteed the right to opt out if they had any reservations about participating in the research. None of the participants opted out during the study period.

AUTHOR CONTRIBUTIONS

AK conceived and designed the present study. AK and MK collected data. AK, TK, and CF analyzed the data. AK drafted and revised the manuscript. AK and CF supervised the study. All authors approved the final manuscript.

FUNDING

This study was supported by National Center of Neurology and Psychiatry Intramural Research Grants for Neurological and Psychiatric Disorders (No. 24-3 and No. 1-3).

ACKNOWLEDGMENTS

We are deeply grateful to all participants and the regional Rehabilitation Coordinators who collaborated in the data collection.

REFERENCES

1. Kooyman I, Dean K, Harvey S, Walsh E. Outcomes of public concern in schizophrenia. *Br J Psychiatry Suppl.* (2007) 50:s29–36. doi: 10.1192/bjp.191.50.s29
2. Hunt GE, Large MM, Cleary M, Lai HMX, Saunders JB. Prevalence of comorbid substance use in schizophrenia spectrum disorders in community and clinical settings, 1990-2017: systematic review and meta-analysis. *Drug Alcohol Depend.* (2018) 191:234–58. doi: 10.1016/j.drugalcdep.2018.07.011
3. Jayatilleke N, Hayes RD, Chang CK, Stewart R. Acute general hospital admissions in people with serious mental illness. *Psychol Med.* (2018) 48:2676–83. doi: 10.1017/S0033291718000284
4. Yates K, Lång U, Cederlöf M, Boland F, Taylor P, Cannon M, et al. Association of psychotic experiences with subsequent risk of suicidal ideation, suicide attempts, and suicide deaths: a systematic review and meta-analysis of longitudinal population studies. *JAMA Psychiatry.* (2019) 76:180–9. doi: 10.1001/jamapsychiatry.2018.3514
5. Wilkins N, Myers L, Kuehl T, Bauman A, Hertz M. Connecting the dots: state health department approaches to addressing shared risk and protective factors across multiple forms of violence. *J Public Health Manag Pract.* (2018) 24(Suppl. 1):S32–41. doi: 10.1097/PHH.0000000000000669
6. Xie H. Strengths-based approach for mental health recovery. *Iranian J Psychiatry Behav Sci.* (2013) 7:5–10.
7. Isaacs AN, Sutton K, Beauchamp A. PERSPECTIVES: recovery oriented services for persons with severe mental illness can focus on meeting needs through care coordination. *J Mental Health Policy Econ.* (2020) 23:55–60.
8. Webster CD, Martin ML, Brink J, Nicholls TL, Desmarais SL. *Manual for the Short-Term Assessment of Risk and Treatability*. Coquitlam, BC: British Columbia Mental Health and Addiction Services (2009).
9. Webster CD, Martin ML, Brink J, Nicholls TL, Middleton C. *The Short-Term Assessment of Risk and Treatability (START)*. Coquitlam, BC: Forensic Psychiatric Services Commission. (2004).
10. Borum R, Bartel P, Forth A. *Manual for the Structured Assessment for Violence Risk in Youth (SAVRY)*. Odessa, FL: Psychological Assessment Resources (2006).
11. de Vogel V, de Ruiter C, Bouman Y, de Vries Robbe M. SAPROF. *Guidelines for the Assessment of Protective Factors for Violence Risk*. Utrecht: Forum Educatief (2009).
12. O'Shea LE, Dickens GL. Short-term assessment of risk and treatability (START): systematic review and meta-analysis. *Psychol Assess.* (2014) 26:990–1002. doi: 10.1037/a0036794
13. Braithwaite E, Charette Y, Crocker A, Reyes A. The predictive validity of clinical ratings of the Short-Term Assessment of Risk and Treatability (START). *Int J Forensic Mental Health.* (2010) 9:271–81. doi: 10.1080/14999013.2010.534378
14. Nicholls TL, Petersen KL, Brink J, Webster CD. A clinical and risk profile of forensic psychiatric patients: Treatment team STARTs in a Canadian service. *Int J Forensic Mental Health.* (2011) 10:187–99. doi: 10.1080/14999013.2011.600234
15. Troquete NA, van den Brink RH, Beintema H, Mulder T, van Os TW, Schoevers RA, et al. Predictive validity of the Short-Term Assessment of Risk and Treatability for violent behavior in outpatient forensic psychiatric patients. *Psychol Assess.* (2015) 27:377–91. doi: 10.1037/a0038270
16. Hart SD, Douglas KS, Guy LS. The structured professional judgement approach to violence risk assessment: Origins, nature, and advances. In: Boer DP, editor. *The Wiley Handbook on the Theories, Assessment and Treatment of Sexual Offending*. Wiley-Blackwell (2016). p.643–66. doi: 10.1002/9781118574003.wattso030
17. Nagata T, Tachimori H, Nishinaka H, Takeda K, Matsuda T, Hirabayashi N. Mentally disordered offenders discharged from designated hospital facilities under the medical treatment and supervision act in Japan: Reoffending and readmission. *Crim Behav Ment Health.* (2019) 29:157–67. doi: 10.1002/cbm.2117
18. Fujii C, Fukuda Y, Ando K, Kikuchi A, Okada T. Development of forensic mental health services in Japan: working towards the reintegration of offenders with mental disorders. *Int J Ment Health Syst.* (2014) 8:21. doi: 10.1186/1752-4458-8-21
19. Nicholls TL, Brink J, Desmarais SL, Webster CD, Martin ML. The Short-Term Assessment of Risk and Treatability (START): a prospective validation study in a forensic psychiatric sample. *Assessment.* (2006) 13:313–27. doi: 10.1177/1073191106290559
20. Doyle M, Lewis G, Brisbane M. Implementing the Short-Term Assessment of Risk and Treatability (START) in a forensic mental health service. *Psyhiatric Bulletin.* (2008) 32:406–8. doi: 10.1192/pb.bp.108.019794
21. Quinn R, Miles H, Kinane C. The Validity of the Short-Term Assessment of Risk and Treatability (START) in a UK medium secure forensic mental health service. *Int J Forensic Mental Health.* (2013) 12:215–24. doi: 10.1080/14999013.2013.832714
22. Department of Health NRMP. *Best Practice in Managing Risk*. (2007).
23. World Health Organization. *ICD-10: International Statistical Classification of Diseases and Related Health Problems: Tenth Revision*. 2nd ed. World Health Organization (2004). Available online at: https://apps.who.int/iris/handle/10665/42980
24. Rice ME, Harris GT. Violent recidivism: assessing predictive validity. *J Consult Clin Psychol.* (1995) 63:737–48. doi: 10.1037/0022-006X.63.5.737
25. Ando K, Soshi T, Nakazawa K, Noda T, Okada T. Risk factors for problematic behaviors among forensic outpatients under the medical treatment and supervision act in Japan. *Front Psychiatry.* (2016) 7:144. doi: 10.3389/fpsyt.2016.00144
26. Rice ME, Harris GT. Comparing effect sizes in follow-up studies: ROC Area, Cohen's d, and r. *Law Hum Behav.* (2005) 29:615–20. doi: 10.1007/s10979-005-6832-7
27. Abidin Z, Davoren M, Naughton L, Gibbons O, Nulty A, Kennedy HG. Susceptibility (risk and protective) factors for in-patient violence and self-harm: prospective study of structured professional judgement instruments START and SAPROF, DUNDRUM-3 and DUNDRUM-4 in forensic mental health services. *BMC Psychiatry.* (2013) 13:197. doi: 10.1186/1471-244X-13-197
28. Desmarais SL, Nicholls TL, Wilson CM, Brink J. Using dynamic risk and protective factors to predict inpatient aggression: reliability and validity of START assessments. *Psychol Assess.* (2012) 24:685–700. doi: 10.1037/a0026668
29. Dickens GL, O'Shea LE. How short should short-term risk assessment be? Determining the optimum interval for START reassessment in a secure mental health service. *J Psychiatr Ment Health Nurs.* (2015) 22:397–406. doi: 10.1111/jpm.12232
30. O'Shea LE, Dickens GL. Predictive validity of the START for unauthorised leave and substance abuse in a secure mental health setting: a pseudo-prospective cohort study. *Int J Nurs Stud.* (2015) 52:970–9. doi: 10.1016/j.ijnurstu.2015.02.007
31. Troquete NA, van den Brink RH, Beintema H, Mulder T, van Os TW, Schoevers RA, et al. Risk assessment and shared care planning in out-patient forensic psychiatry: cluster randomised controlled trial. *Br J Psychiatry.* (2013) 202:365–71. doi: 10.1192/bjp.bp.112.113043

32. Wilson CM, Desmarais SL, Nicholls T, Brink J. The role of client strengths in assessments of violence risk using the short-term assessment of risk and treatability (START). *Int J Forensic Mental Health.* (2010) 9:282–93. doi: 10.1080/14999013.2010.534694
33. O'Shea LE, Picchioni MM, Dickens GL. The predictive validity of the short-term assessment of risk and treatability (START) for multiple adverse outcomes in a secure psychiatric inpatient setting. *Assessment.* (2016) 23:150–62. doi: 10.1177/1073191115573301
34. Gray NS, Benson R, Craig R, Davies H, Fitzgerald S, Huckle P, et al. The Short-Term Assessment of Risk and Treatability (START): a prospective study of inpatient behavior. *Int J Forensic Mental Health.* (2011) 14:132–46. doi: 10.1080/14999013.2011.631692
35. Hawton K, Zahl D, Weatherall R. Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. *Br J Psychiatry.* (2003) 182:537–42. doi: 10.1192/bjp.182.6.537
36. Runeson B, Haglund A, Lichtenstein P, Tidemalm D. Suicide risk after nonfatal self-harm: a national cohort study, 2000-2008. *J Clin Psychiatry.* (2016) 77:240–6. doi: 10.4088/JCP.14m09453
37. Dennis M, Scott CK. Managing addiction as a chronic condition. *Addict Sci Clin Pract.* (2007) 4:45–55. doi: 10.1151/ascp074145
38. World Health Organization. *Atlas on Substance Use 2010: Resources for the Prevention and Treatment of Substance Use Disorders 2010*. World Health Organization (2017).
39. Boles SM, Miotto K. Substance abuse and violence: a review of the literature. *Aggression Violent Behav.* (2003) 8:155–74. doi: 10.1016/S1359-1789(01)00057-X
40. Swartz MS, Swanson JW, Hiday VA, Borum R, Wagner HR, Burns BJ. Violence and severe mental illness: the effects of substance abuse and nonadherence to medication. *Am J Psychiatry.* (1998) 155:226–31.
41. Imai A, Hayashi N, Shiina A, Sakikawa N, Igarashi Y. Factors associated with violence among Japanese patients with schizophrenia prior to psychiatric emergency hospitalization: a case-controlled study. *Schizophr Res.* (2014) 160:27–32. doi: 10.1016/j.schres.2014.10.016
42. Marriott R, O'Shea LE, Picchioni MM, Dickens GL. Predictive validity of the Short-Term Assessment of Risk and Treatability (START) for multiple adverse outcomes: the effect of diagnosis. *Psychiatry Res.* (2017) 256:435–43. doi: 10.1016/j.psychres.2017.07.009
43. Kesteren J, Mayhew P, Nieuwbeerta P. *Criminal Victimisation in Seventeen Industrialised Countries: Key-findings from the 2000 International Crime Victims Survey*. The Hague: Ministry of Justice (2000).
44. Anderson F, Howard L, Dean K, Moran P, Khalifeh H. Childhood maltreatment and adulthood domestic and sexual violence victimisation among people with severe mental illness. *Soc Psychiatry Psychiatr Epidemiol.* (2016) 51:961–70. doi: 10.1007/s00127-016-1244-1
45. Khalifeh H, Moran P, Borschmann R, Dean K, Hart C, Hogg J, et al. Domestic and sexual violence against patients with severe mental illness. *Psychol Med.* (2015) 45:875–86. doi: 10.1017/S0033291714001962
46. Kisely SR, Campbell LA, O'Reilly R. Compulsory community and involuntary outpatient treatment for people with severe mental disorders. *Cochrane Database Syst Rev.* (2017) 3:CD004408. doi: 10.1002/14651858.CD004408.pub5
47. Nonstad K, Nesset MB, Kroppan E, Petersen TW, Nottestad JA, Almvik R, et al. Predictive validity and other psychometric properties of the Short-Term Assessment of Risk and Treatability (START) in a Norwegian high secure hospital. *Int J Forensic Mental Health.* (2010) 9:294–9. doi: 10.1080/14999013.2010.534958
48. O'Shea LE, Dickens GL. Role of assessment components and recent adverse outcomes in risk estimation and prediction: use of the Short Term Assessment of Risk and Treatability (START) in an adult secure inpatient mental health service. *Psychiatry Res.* (2016) 240:398–405. doi: 10.1016/j.psychres.2016.04.068
49. de Vries Robbé M, de Vogel V, de Spa E. Protective factors for violence risk in forensic psychiatric patients: a retrospective validation study of the SAPROF. *Int J Forensic Mental Health.* (2011) 10:178–86. doi: 10.1080/14999013.2011.600232
50. Lodewijks HP, de Ruiter C, Doreleijers TA. The impact of protective factors in desistance from violent reoffending: a study in three samples of adolescent offenders. *J Interpersonal Violence.* (2010) 25:568–87. doi: 10.1177/0886260509334403
51. Lodewijks HP, Doreleijers TA, de Ruiter C, Borum R. Predictive validity of the Structured Assessment of Violence Risk in Youth (SAVRY) during residential treatment. *Int J Law Psychiatry.* (2008) 31:263–71. doi: 10.1016/j.ijlp.2008.04.009
52. Steadman HJ, Mulvey EP, Monahan J, Robbins PC, Appelbaum PS, Grisso T, et al. Violence by people discharged from acute psychiatric inpatient facilities and by others in the same neighborhoods. *Arch Gen Psychiatry.* (1998) 55:393–401. doi: 10.1001/archpsyc.55.5.393
53. Cascardi M, Mueser KT, DeGiralomo J, Murrin M. Physical aggression against psychiatric inpatients by family members and partners. *Psychiatr Serv.* (1996) 47:531–3. doi: 10.1176/ps.47.5.531

Conflict of Interest: AK receive royalties from texts or books she has published on risk assessment.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 02 August 2021
doi: 10.3389/fpsyt.2021.670957

Effectiveness of an Individual Cognitive-Behavioral Intervention for Serious, Young Male Violent Offenders: Randomized Controlled Study With Twenty-Four-Month Follow-Up

Martin Lardén[1,2]*, *Jens Högström*[3,4] *and Niklas Långström*[1,5,6]

[1] Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden, [2] Swedish Prison and Probation Service, Norrköping, Sweden, [3] Centre for Psychiatry Research, Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden, [4] Stockholm Health Care Services, Stockholm, Sweden, [5] Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden, [6] National Board of Health and Welfare, Stockholm, Sweden

OPEN ACCESS

Edited by:
Pietro Pietrini,
IMT School for Advanced Studies Lucca, Italy

Reviewed by:
Ricardo Barroso,
University of Trás-os-Montes and Alto Douro, Portugal
Malin Hildebrand Karlén,
University of Gothenburg, Sweden

***Correspondence:**
Martin Lardén
martin.larden@kriminalvarden.se

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: *22 February 2021*
Accepted: *30 June 2021*
Published: *02 August 2021*

Citation:
Lardén M, Högström J and Långström N (2021) Effectiveness of an Individual Cognitive-Behavioral Intervention for Serious, Young Male Violent Offenders: Randomized Controlled Study With Twenty-Four-Month Follow-Up. Front. Psychiatry 12:670957. doi: 10.3389/fpsyt.2021.670957

Background: Psychological recidivism-reducing interventions with serious, young violent offenders in residential care have unsatisfactory effects. We tested if a complementary individual cognitive behavioral therapy (iCBT) intervention focusing problem-solving, cognitive self-control, and relapse prevention reduces criminal recidivism beyond usual institutional care encompassing interventions such as social skills training and prosocial modeling (treatment-as-usual; TAU).

Method: We consecutively approached 115 eligible serious, male violent crime offenders in five residential treatment homes run by the Swedish National Board of Institutional Care. Eighty-one (70%) 16 to 21-year-old youth at medium-high violent recidivism risk were included and randomized to an individualized 15 to 20-session CBT intervention plus TAU (n = 38) or to TAU-only (n = 43), 4–6 months before release to the community. Participants were assessed pre- and post-treatment, at 12 months (self-reported aggressive behavior, reconvictions) and 24 months (reconvictions) after release. Intent-to-treat analyses were applied.

Results: The violent reconviction rate was slightly higher for iCBT+TAU vs. TAU-only youth at 12 months (34 vs. 23%, d = 0.30, 95% CI: −0.24 to 0.84) and 24 months following release (50 vs. 40%, d = 0.23, 95% CI: −0.25 to 0.72), but neither of these differences were significant. Cox regression modeling also suggested non-significantly, negligibly to slightly more violent, and any criminal recidivism in iCBT+TAU vs. TAU-only youth during the entire follow-up. Further, we found no significant between-group differences in conduct problems, aggression, and antisocial cognitions, although both iCBT+TAU and TAU-only participants reported small to large within-group reductions across outcome measures at post-treatment. Finally, the 12-month follow-up suggested marginally more DSM-5 Conduct Disorder (CD) symptoms of "aggression to people and animals" in iCBT+TAU vs. TAU-only youth (d = 0.10, 95% CI: −0.40 to 0.60) although this difference was not significant.

Conclusion: We found no additive effect of individual CBT beyond group-based TAU in residential psychological treatment for serious, young male violent offenders. Limited sample size and substantial treatment dropout reduced the robustness of intent-to-treat effect estimates. We discuss the possible impact of treatment dose and integrity, participant retention, and TAU quality.

Keywords: violent crime, randomized controlled (clinical) trial, treatment outcome, reoffending, young offenders, cognitive behavioral therapy, residential treatment, aggression

INTRODUCTION

Interpersonal violence is a profound global social and public health problem. For instance, the World Health Organization (WHO) concludes that homicide is the third leading cause of death internationally for 15 to 44-year-old males (1). In a recent annual victim survey in Sweden, 3.5% of the population over 15 years reported physical assault victimization during 2018 (2) whereas 1.1% of US residents over 12 years described having been a victim of violent crime in 2019 (3). Considering the huge costs in human suffering and economic terms alike, even small reductions in violent crime is important [e.g., (4)]. In addition to broader universal and selective prevention efforts, effective treatment of identified, and convicted violent offenders is a vital component of a comprehensive violence prevention strategy. However, working with young in contrast to adult offenders requires attention to dissimilar judicial status, higher rates of antisocial behavior, and recidivism risk but also higher developmental malleability (5–7).

Providing effective recidivism-reducing interventions to young serious violent offenders, often in residential care, is a prioritized task for legal and social service authorities worldwide. However, placing antisocial youth in specialized residential treatment centers may have adverse effects, for example increased reoffending risk (8–10) and impaired adult physical and mental health (11). Many young offenders experience isolation and violations of their basic rights in institutions (12) and incarceration of young offenders may reinforce destructive behaviors (13). For instance, through attention and encouragement from peers when exhibiting oppositional or aggressive behaviors toward staff. Such negative influences or *contagion effects* suggest a need for individualized interventions to complement the more common group-based interventions in juvenile forensic institutions (12, 14).

Although treatment effects tend to be small, systematic reviews have suggested promising treatments to reduce criminal recidivism [e.g., (5, 15)]. Regarding young offenders, Armelius and Andreassen (16) systematically reviewed 12 randomized controlled trials (RCTs) and non-randomized controlled trials of interventions based on cognitive behavioral therapy (CBT) targeting 12 to 22-year-old incarcerated young offenders. Cognitive behavioral therapy-based interventions were associated with a small recidivism risk reduction (10% on average) in any new crime at 12-month follow-up compared to controls. In contrast, no significant treatment effects were found at 6 and 24 months, nor did data suggest differences across different CBT interventions. Morales et al. (4) conducted a systematic review of 31 randomized or quasi-experimental studies of 12 to 21-year-old offenders incarcerated for serious or repeated violent or non-violent offending. Their findings suggested marginal reductions of violent and general recidivism (odds ratio $= 1.27$, $p = 0.005$) for cognitive behavioral and multimodal interventions. Compared to control groups, Koehler et al. (17) found CBT interventions to be more effective (mean reduction 13%) in reducing reoffending than non-CBT interventions (mean reduction 6%) in a systematic review of treatment programs in Europe for offenders <25 years of age. In a meta-analysis of 27 primary controlled studies, De Swart et al. (10) compared the effectiveness of broadly defined *evidence-based institutional treatment* with other forms of institutional and non-institutional care with at least post-treatment measures as outcome. Their results indicated that institutional care could be as effective as non-institutional care, and that evidence-based interventions on average proved more effective than institutional care-as-usual ($d = 0.34$). Specifically, CBT-interventions had a moderate effect ($d = 0.50$) based on a summary measure containing delinquency, behavior problems, skills, and a miscellaneous problem category.

Importantly, a meta-analysis of six studies with 13 effect sizes by Hoogsteder et al. (18) suggested that interventions with *individualized CBT components* could be more effective in reducing severe aggressive behavior in adolescents compared to regular care or treatment-as-usual (TAU) with no CBT components (between group $d = 1.14$). The authors conclude that the addition of individually tailored interventions based on the *risk, needs, and responsivity* (RNR) principles (19) to group interventions might improve outcome for aggressive adolescents.

The rationale for this study was the weak effects found previously for interventions administered in routine practice targeting incarcerated serious, young male violent offenders with medium to high recidivism risk. Hence, we attempted to improve the existing evidence base by conducting a five-site RCT in Sweden to evaluate the effectiveness of an individual, manualized CBT intervention (iCBT) added to standard group-based treatment (TAU) in reducing reoffending, compared to TAU alone. Specifically, our hypothesis was that iCBT+TAU would reduce self-reported conduct problems, aggression, and antisocial cognitions as well as criminal recidivism more than TAU-only.

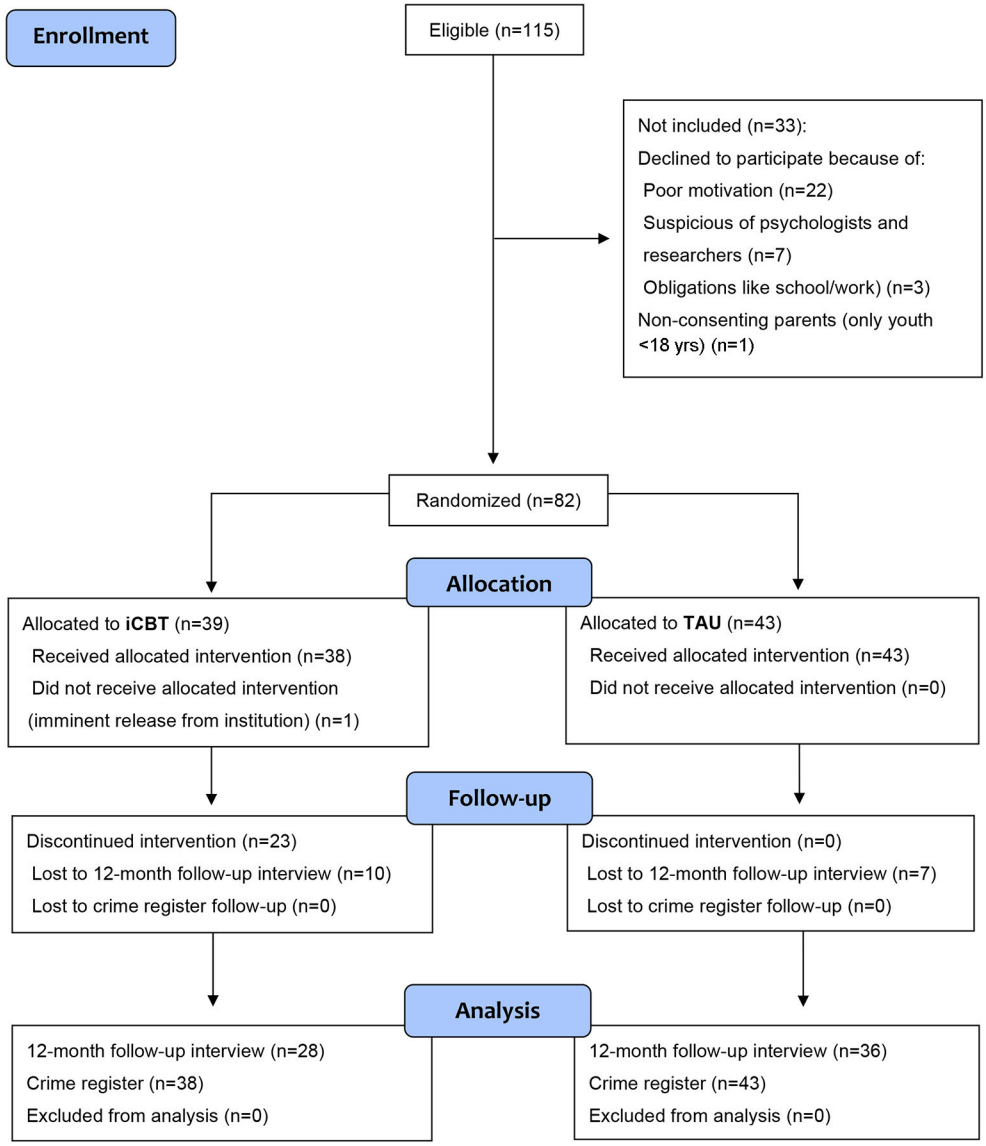


FIGURE 1 | Flowchart of a randomized controlled trial (RCT) comparing an individualized cognitive-behavioral intervention (iCBT) plus group-based treatment-as-usual (TAU) with TAU-only among serious, young male violent offenders.

MATERIALS AND METHODS

Setting

We conducted a randomized, controlled trial in Sweden across five (out of the six existing) residential facilities for serious young violent offenders sentenced by general criminal courts to secure care according to the Closed Institutional Youth Care Act. The secure facilities, administered by the National Board of Institutional Care, are located across Sweden and participant inclusion occurred between December 2003 and August 2006. Sweden has no formal separation of juvenile and adult justice systems and Closed Institutional Youth Care was introduced on January 1, 1999, as a new sentence for adolescents between 15 (age of criminal responsibility) and 17 years guilty of serious criminal offenses. Crime categories usually include (aggravated) robbery or assault, homicide or rape. Closed Institutional Youth Care was introduced as a custodial replacement to imprisonment with adults in the general prison system. Sentence lengths vary from 14 days to 48 months, the full term is served in an institution and there is no parole. During 2000–2006, when the youth in this study were convicted, 115–120 individuals yearly (97% male) were convicted to an average of 9 months in secure care according to the Closed Institutional Youth Care Act (20). For a detailed account, see also Pettersson (21).

Participants

We included young male offenders with 4–6 months remaining of an ongoing residential youth care sentence of ≥6 months for a non-sexual, violent crime. We defined violent offenses as homicide, assault, assault of an officer, robbery, and aggravated arson while sexual offenses were not included. Attempted or aggravated versions of these offenses were included whenever applicable. Female offenders were not included due to very small numbers overall and placement in non-participating residential facilities. Youth were ineligible to participate if they did not speak Swedish sufficiently well or had current severe, destabilizing psychiatric disorders involving psychotic or suicidal features.

Twenty-one youth were lost from possible participation prior to being asked. Eleven of these were either moved to a non-participating institution or available psychotherapist(s) had no room at the time to take them on for iCBT following possible inclusion. Another ten individuals were not asked due to miscommunication between researchers and staff at the five participating institutions. Finally, four youth were not approached due to intellectual impairment (total IQ < 70) as ascertained from psychological testing or a psychiatrist or psychologist's clinical judgment.

A total of 115 eligible male youth were asked for possible inclusion, 82 of which (71.3%) agreed to participate following oral and written informed consent (see **Figure 1**). Main self-reported reasons for non-participation included poor motivation and being suspicious of psychologists and researchers. Participants ($M = 17.7$, $SD = 0.9$) were moderately younger than non-participants ($M = 18.3$, $SD = 1.0$, $p < 0.01$). The proportion of youth that consented to inclusion ranged from 67% (18/27) to 74% (17/23) across the five residential treatment homes. The average sentence length for participating youth was 10.2 months ($SD = 6.3$, range: 5.0–48.0). Since one male was mistakenly asked to participate just before release, 81 subjects were randomized either to TAU+iCBT ($n = 38$) or TAU-only ($n = 43$); the difference in numbers was due to chance.

Sociodemographic Characteristics

Participants were all males aged 16–21 years at inclusion. Twenty-five percent ($n = 20$) were non-immigrants with majority ethnicity, defined as being born in Sweden with both biological parents born in Sweden. Forty-six percent ($n = 37$, including two trans-nationally adopted boys) were first-generation immigrants, born abroad and with both parents born abroad. Thirty percent ($n = 24$) were second-generation immigrants, born in Sweden with one or both parents born abroad. For further details, see **Table 1**.

Procedure

The Regional Research Ethics Committee in Stockholm approved of the study (dnr: 03–315). Eligible young violent offenders at the five participating residential treatment facilities were consecutively asked to participate by a psychotherapist or another staff member, usually the head of the ward. Subjects provided oral and written informed consent to participate. For participants younger than 18 years, oral and written permission were also obtained from his legal guardian. At baseline, the youth completed six self-report questionnaires (described below) provided by the staff at the residential facilities. Participants were informed that all information they provided during baseline assessments and throughout the study was for research only and would not be accessible for ward and clinical staff. The youth were given as much time they needed for the completion of the questionnaires and instructed to ask a nearby staff member for help in case of difficulty to read or understand items. The staff made sure that the youth completed the questionnaires on his own, with no other youth disturbing him. Each participant personally put his filled-out questionnaires in an envelope and sealed it followed by the envelope being collected by the research assistant. Within a week from the completion of the questionnaires, the youth was interviewed and assessed face-to-face with the SAVRY and the PCL:SV by a trained research assistant (B.Sc. in psychology and criminology). The research assistant was not involved in youth care and all participants were again carefully informed that no information provided during assessments would be revealed to ward staff. We also explicitly informed about the only exception to this: a duty to report to the social services (according to the Swedish Social Services Act) if the youth would reveal information about any specific, named child currently at imminent risk of suffering harm, including child abuse or neglect. No such reporting was deemed necessary during the trial.

Participants received 100 SEK (approximately 10.50 USD) for completion of self-report questionnaires and participation in the baseline interview. One to three weeks before leaving the institution, the youth completed post-treatment questionnaires, again administered by the staff. Again, we reminded participants that all information was for research only and would not be used against them. Subjects received another 100 SEK upon completion of the post-treatment assessment.

Randomization

Participants were randomized to either iCBT plus the standard intervention (TAU) (experiment group) or TAU-only (control group) across all five sites to reduce the risk of bias due to intervention differences between units. Randomization was obtained with a pre-existing, computer-generated series in an unweighted fashion with either "iCBT" or "TAU" printed on paper at an overall 1:1 ratio. Every single printout was individually placed in opaque envelopes held centrally by the research group and later drawn by the last author when contacted by the research assistant or a site coordinator reporting that a specific eligible youth had completed pre-trial assessments.

Interventions

Individual Cognitive Behavior Therapy

Individual Cognitive Behavior Therapy (iCBT) (23) is a manualized treatment program for serious violent offenders, developed by the first author, and based on extant research on violent offending and evidence-based treatment of serious young offenders at the beginning of the 2000s (24–26). Andrews' and Bonta's (27) influential textbook *Psychology of criminal conduct* provided important inspiration for the program, particularly regarding adherence to the RNR principles of

TABLE 1 | Baseline sociodemographic and pre-treatment data for participants in an RCT of an individualized CBT intervention (iCBT) plus treatment-as-usual (TAU) vs. TAU-only among convicted serious, young male violent offenders.

Baseline characteristic	iCBT participants ($n = 38$)	TAU participants ($n = 43$)	Effect size for difference Cohen's *d*
Sociodemographic variables			
Age at inclusion, years, *M, SD*	18.0 (0.9)	17.7 (0.7)	*0.29*^{ns}
Urban area of residence, % (*n*)	45% (17)	67% (29)	*–0.47**
Migrant status			
Born in Sweden w both parents born in Sweden, % (*n*)	32% (12)	19% (8)	
Born in Sweden w one parent born abroad, % (*n*)	29% (11)	30% (13)	*–0.31*^{ns}
Born abroad, % (*n*)	40% (15)	51% (22)	
Index offense			
(Attempted) homicide, % (*n*)	11% (4)	5% (2)	
(Aggravated) assault, % (*n*)	29% (11)	26% (11)	*–0.26*^{ns}
(Aggravated) robbery, % (*n*)	58% (22)	65% (28)	
Aggravated arson, % (*n*)	3% (1)	5% (2)	
Length of index sentence, months, *M, SD*	10.53 (7.27)	10.00 (5.36)	0.08^{ns}
Residential treatment home			
A, % (*n*)	26% (10)	23% (10)	
B, % (*n*)	24% (9)	23% (10)	
C, % (*n*)	21% (8)	23% (10)	–0.05^{ns}
D, % (*n*)	18% (7)	21% (9)	
E, % (*n*)	11% (4)	9% (4)	
Psychological functioning, aggression, and social cognition			
Youth Self-Report, affective[a] (0–24), *M, SD*	4.89, 4.05	4.77, 3.21	0.04^{ns}
Youth Self-Report, anxiety[a] (0–12), *M, SD*	2.45, 1.80	2.35, 2.15	0.05^{ns}
Youth Self-Report, somatic[a] (0–14), *M, SD*	2.39, 2.49	1.91, 1.94	*0.22*^{ns}
Youth Self-Report, ADHD[a] (0–10), *M, SD*	3.29, 2.51	3.58, 1.99	–0.13^{ns}
Youth Self-Report, oppositional defiant[a] (0–10), *M, SD*	3.71, 2.75	3.91, 2.24	–0.08^{ns}
Youth Self-Report, conduct problems[a] (0–28), *M, SD*	7.53, 4.90	6.79, 3.64	0.17^{ns}
Aggression, total[b] (0–42), *M, SD*	11.18, 7.37	10.07, 6.24	0.16^{ns}
Aggression, proactive[b] (0–20), *M, SD*	5.18, 4.19	4.65, 3.27	0.14^{ns}
Aggression, reactive[b] (0–12), *M, SD*	3.55, 1.91	3.28, 1.94	0.14^{ns}
Antisocial cognitions[c] (40–240), *M, SD*	121.50, 43.50	113.79, 28.27	*0.21*^{ns}
Socio-moral reflection ability, total score[d] (11–33), *M, SD*	16.97, 3.73	17.81, 3.78	–0.08^{ns}
Substance abuse			
SAVRY item 19[e] % (*n*)			
Low	26% (10)	21% (9)	
Medium	18% (7)	40% (17)	0.12^{ns}
High	55% (21)	40% (17)	
Psychopathic personality traits and recidivism risk			
PCL:SV, total score (0–24), *M, SD*	12.47, 4.66	12.95, 5.34	–0.10^{ns}
PCL:SV, interpersonal/affective factor (0–12), *M, SD*	4.79, 3.02	5.37, 3.30	–0.18^{ns}
PCL:SV, unstable lifestyle/antisocial factor (0–12), *M, SD*	7.89, 2.19	7.79, 2.62	0.04^{ns}
SAVRY, total risk score[f] (0–48), *M, SD*	23.42, 6.26	22.33, 7.62	0.16^{ns}
SAVRY, overall risk[g], % (*n*)			
Low	10% (4)	12% (5)	
Medium	58% (22)	44% (19)	–0.18^{ns}
High	32% (12)	44% (19)	
SAVRY, total protective score[h] (0–6), *M, SD*	3.34, 1.48	2.84, 1.82	*0.30*^{ns}

Following Cohen (22): Italicized figures denote 0.20 < d < 0.50, equal to a "small" effect size.

[a] *DSM diagnosis-oriented subscale, past 6 months.*

[b] *No specified period.*

[c] *Self-reported antisocial cognitive distortions during past 6 months according to How I think, total score. Higher scores indicate more distortions.*

[d] *Higher score indicates more mature socio-moral judgments.*

[e] *SAVRY item 19, Substance use difficulties, refers to alcohol or drug use that is sufficiently severe to cause problems in physical health or in one or more major areas of functioning.*

[f] *Summary risk score across all 24 SAVRY risk items rated 0 = low, 1 = medium, or 2 = high.*

[g] *Distribution of overall structured professional recidivism risk judgments over low, medium, and high risk.*

[h] *Summary score across all six protective factors rated 0 = absent or 1 = present.*

^{ns} $p > 0.05$, $^{*}p < 0.05$.

effective rehabilitation. These principles suggest that effective treatments against antisocial behavior should focus on offenders with higher recidivism risk, target criminogenic needs that drives criminal behavior, and address individual learning styles as well as resources and barriers within and around the individual offender responsivity (19).

Social learning and cognitive behavioral theories and methods as well as treatment philosophy were described in detail in Lardén (28), that was mandatory reading for treatment providers together with the formal iCBT manual (23). The main purpose of iCBT is to enhance adolescents' prosocial skills by practicing newly learned problem-solving and cognitive self-control strategies to manage everyday situations at the institutions. In a relapse prevention strategy, these new skills are hereafter adapted and planned for use in post-release real-life situations. Relapse prevention also included interpersonal skills training and identification of social network persons who could function as prosocial support after release. The iCBT intervention has four main phases aimed to strengthen prosocial skills and reduce recidivism risk: motivation and goal setting, social problem-solving training, cognitive self-control training, and relapse prevention. A complete iCBT intervention comprises 15–20 individual 45-min one-to-one sessions, administered approximately once per week.

An individual case formulation based on identified criminogenic needs was conducted at the start of the intervention. The case formulation contained a description of the adolescent's criminal history focusing on both the index offense and prior antisocial development. First, five criminogenic need domains related to recidivism risk (19) were mapped: persistence and pervasiveness of antisocial behavior, antisocial attitudes and values, substance misuse, temperament and personality factors that influence antisocial behavior, as well as psychiatric morbidity related to antisocial behavior. Second, antisocial peers and associates involved in or supportive of the adolescent's antisocial behavior around the index crime were identified, as well as persons who could function as prosocial role models. Prior experiences from school and vocational training were also described. Finally, the adolescent's strengths and resources that could protect against recidivism or enhance treatment progress were listed. The case formulation was a basis for the idiographic iCBT content delivered according to 15 manualized sessions (see Appendix 1 in **Supplementary Material**). Depending on the adolescent's specific needs and responsivity, some sessions were repeated up to three times.

For the iCBT group, the intervention was added to ordinary treatment curricula at participating institutions, while controls received solely the ordinary curricula (TAU). Seven therapists (4 men and 3 women) were recruited from the treatment staff at participating institutions (mean age = 49.3, range 20–54 years). Three were board-certified clinical psychologists, two academic social workers, and two were staff with a general education and specific training in individual psychotherapy. All, except one psychologist, had more than 10 years' experience of clinical work with serious young offenders. All therapists/iCBT providers attended an initial 2-day iCBT training seminar. Treatment integrity was upheld through repeated, individual supervision by e-mail up to once per month and through 1- or 2-day meetings twice a year.

Treatment-As-Usual

Treatment-as-usual consisted of ordinary residential treatment interventions at the five participating institutions; the specific contents varied across sites. Most of the time in residential homes was spent on structured activities of daily living, formal education, and leisure activities. The most common active intervention was interpersonal skills training sessions based on Aggression Replacement Training (ART) (29) with up to weekly group-based sessions. Other common interventions included ART-based anger management training, usually with group sessions once weekly for 10 weeks and supportive family therapy/network meetings with the individual young offender and his family members. To ascertain similar intensities of the TAU condition for both iCBT+TAU and TAU-only youth, we reminded the sites to maintain the ordinary treatment plan whenever a new participant was included in the study. No other individual psychological treatments took place during the study period. Apart from occasional medication with SSRIs, pharmacological treatment with antipsychotics, mood stabilizers, stimulants, and medications against substance misuse was uncommon in residential treatment at the time of the study.

Measures

Self-Report Questionnaires

Youth Self-Report

The *Youth Self-Report* (YSR) (30) is a 111-item self-report questionnaire for 11 to 18-year-olds that taps emotional and behavioral problems dimensionally. Youth respond about the past 6 months on a three-point scale: *0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true*. Studies suggest that the DSM-oriented subscales of the YSR have acceptable validity (31, 32). The YSR has been translated and validated in Sweden and Swedish validation data suggest acceptable to good internal consistency for the three tested affective-, anxiety-, and attention problem scales for boys aged 13–18 years [Cronbach's $\alpha \geq 0.70$, (33)]. We used YSR's six DSM-oriented subscales: *affective-, anxiety-, somatic-, ADHD-, oppositional defiant, and conduct problems* for baseline assessments and specifically oppositional defiant and conduct problems for pre-post treatment comparisons.

Reactive and Proactive Aggression Scale

We used a self-report version of the *Reactive and proactive aggression* scale (34) tapping two subtypes of aggressive behavior. The instrument contains 21 items; 10 measures proactive aggression and 6 reactive aggression while 5 are neutral items not loading on either scale. An example item is *"Threatens others."* Subjects respond on a three-point Likert-type scale (*0 = never, 1 = sometimes or 2 = often*) and items are added in a linear and unweighted fashion to subscale summary scores. The zero-order correlation between the 10-item proactive and 6-item reactive aggression scales was high in the original version ($r = 0.70$). Internal consistency was also high (Cronbach's $\alpha = 0.94$ and 0.92, respectively). In this study, internal consistency was high for the

total and proactive scales (α = 0.81 and 0.85, respectively), but weaker for the reactive scale (α = 0.57). We used the total score, as well as proactive and reactive aggression subscales for baseline and post-treatment assessments.

How I Think

How I Think (HIT) (35) is a 54-item self-report questionnaire addressing self-serving cognitive distortions. It contains 39 items tapping attitudes or beliefs related to antisocial behavior, 8 items to control anomalous responses, and another 7 items are positive fillers. Subjects respond on a six-point Likert scale (from *1, I agree strongly* to *6, I disagree strongly*) where high scores indicate more cognitive distortions. Internal consistency expressed as Cronbach's α was 0.94 in this study, compared to 0.96 in a previous Swedish report with adolescents as well as for the original English version (35, 36).

Sociomoral Reflections Measure—Short Form

Sociomoral Reflections Measure—Short Form (SRM-SF) (37) is a self-report instrument addressing moral judgement development according to the *neo-Kohlbergian typology*. The SRM-SF contains brief contextual statements and moral evaluation questions. Subjects evaluate and justify how important it is to act in a certain way according to 11 open-ended questions. Response patterns are evaluated and coded by an expert rater according to the SRM-SF manual. Studies suggest acceptable reliability and validity of such coding in youth (37–39), including good internal consistency (Cronbach's α = 0.93) and inter-rater reliability for the total score (ICC = 0.83) (37), expressed with the single rater intraclass correlation coefficient (ICC) (40). The Swedish version exhibited similar good inter-rater reliability (single rater ICC = 0.82) in a previous study of antisocial and matched general population adolescents (36). For the current sample, we found good internal consistency (α = 0.79) and inter-rater reliability for total scores (single rater ICC = 0.83).

Baseline: Expert Ratings

The Structured Assessment of Violence Risk in Youth

*The Structured Assessment of Violence Risk in Youth (*SAVRY) (41) is a risk assessment protocol based on the structured professional judgment model and includes ten historical risk factors, six social/contextual, eight individual risk factors, and six protective factors. Risk factors were coded on a three-level ordinal scale as *low (0), medium (1),* or *high (2)* while protective factors were coded dichotomously as *present (1) or not (0)*. SAVRY was translated into Swedish by the last author following the North American original as closely as possible and yet being sensitive to Swedish social and legal conditions. We made a minor adjustment regarding the final professional judgment of future violence risk by excluding sexual crime from recidivism that the rater should aim at predicting, as risk factors for sexual reoffending in adolescents are partly different from those covered by SAVRY (42–45). We summed the ratings of the 24 historical, social/contextual, and individual risk factors, resulting in total SAVRY risk scores ranging from 0 to 48. Interrater reliability for the SAVRY summary risk score, obtained from 25 joint sit-in ratings by two trained, independent raters, was an excellent single rater ICC = 0.92.

Psychopathy Checklist: Screening Version

The Psychopathy Checklist: Screening Version (PCL:SV) (46) was developed from the original Psychopathy Checklist-Revised (47) to screen for possible psychopathy. The PCL:SV is validated for use with individuals from age 16. The PCL:SV consists of 12 items based on the 20-item PCL-R. Each item of the PCL:SV is scored on a three-point ordinal scale; *not present (0), partly/maybe present (1),* or *definitely present (2)*. Inter-rater reliability, again measured across 25 individuals, was high (single rater ICC = 0.81) for PCL:SV total scores and interpersonal/affective and unstable lifestyle/antisocial factors had interrater reliability scores of 0.81 and 0.68, respectively. Whether violent offenders with many psychopathic personality traits are truly treatable has been an important question in correctional and forensic practice [e.g., (48–50)]. Although components of expert-rated psychopathy (according to PCL:R/-SV) beyond antisocial lifestyle tend to be unrelated to violent recidivism, we tested if PCL:SV psychopathy differed between youth randomized to iCBT+TAU and TAU-only. However, no baseline differences were found, and psychopathy was not used as a moderator variable.

Outcome

Aggressive Behavior

Aggressive behavior at 12-month follow-up was measured as a conduct disorder (CD) symptom summary score derived from structured questions in follow-up telephone interviews with each participant's social service case manager, the youth himself, or both. The interviewing research assistant was masked to the youth's prior residential treatment allocation (iCBT+TAU or TAU-only) and participants and social service case managers were explicitly instructed at the beginning of the interview to not tell the interviewer details about prior residential treatment. We obtained interpretable data from 58 youth interviews and 49 interviews with social service staff. When both sources were available (n = 43), we used the highest reported value. The outcome score was based on an unweighted summary of the seven[1] aggressive CD symptoms in DSM-5 (51). Interview responses were provided on a five-point scale (*never, 1–2 times, 3–5 times, 6–10 times*, and *11+ times*) regarding the past 12 months (i.e., from the end of treatment to the day of the interview). We recoded answers into a three-point scale: (*0 = never, 1 = 1–2 times, 2 = 3+ times*) resulting in a possible score range of 0–16. Aggressive CD symptom data were provided by 64 of the 81 participants (79%). Ten iCBT participants and seven TAU-only controls were unavailable for this outcome.

Register-Based Criminal Reconvictions

We also addressed registered criminal re-offending during follow-up leading to a conviction registered in the National

[1]To better capture sexually abusive behavior without explicit force, we added "has had sex with someone unwilling by using pressure or drugs" as an additional item to complement the original aggressive CD criterion "has forced someone into sexual activity".

Crime Register held by the Swedish National Council for Crime Prevention (2). Data for this outcome were obtained for all participants until December 31, 2008.

Violent recidivism included homicide, assault, violence against an officer, robbery, and aggravated arson. Aggravated and attempted versions of these offenses were also included whenever applicable. Crime Register data reflect that the Swedish judicial system does not allow for plea bargaining so violent crime charges are never pleaded down, precluding loss of cases due to plea bargaining. Further, the Swedish legal system convicts individuals as guilty regardless of the presence of any psychiatric disorder, although sentencing might be informed by such disorders.

Any criminal recidivism included reconvictions for all violent offenses listed above but also gross violation of a woman's/person's integrity, illegal coercion, illegal threats, and intimidation, rape and other sexual crimes, and all other offenses according to the Swedish Penal Code and Narcotics Act. The nationwide National Crime Register provided criminal reconviction data for violent and general crimes, respectively, at 12- and 24-month follow-ups. We addressed *frequency of reoffending* as the count of new registered crimes across separate court sentences committed at 12- and 24-month follow-up, respectively.

Statistical Analysis

We computed Cohen's *d:s* with 95% confidence interval as effect size measure with the freely available Practical Meta-Analysis Effect Size Calculator provided by the Campbell Collaboration [(52), based on (53)]. Following Cohen (22), *d*:s were interpreted as marginal (<0.20), small (0.20–0.49), moderate (0.50–0.79), or large (0.80+) effects. Pre- to post-test comparisons were done variable-wise as paired *t*-tests that were translated into Cohen's *d*:s using the freely available effect size calculator provided by the Memorial University of Newfoundland, Canada (54).

For pre- to post-treatment changes across six outcomes (**Table 2**), we used a mixed-effects ANOVA with group (iCBT vs. TAU-only) entered as a fixed effect and time (pre- vs. post-measurement) as a random effect in a repeated measures design. Missing data, usually less than five data points but occasionally up to ten within one subject, were handled by single mean imputation. For registered criminal recidivism during the entire follow-up period, we used Cox regression modeling with five empirically plausible covariates (age, urban residence, migrant status, antisocial cognitions, and SAVRY protective factors) with baseline differences of $d \geq 0.20$). All statistical analyses were performed with the IBM Statistical Package for the Social Sciences (SPSS) version 24.

Power Analysis

Based on our reading of the literature when planning the study, we assumed a, in hindsight overly optimistic, difference in violent recidivism rates of 50 vs. 25% for iCBT+TAU over TAU-only. Before starting the study, we decided on a less conservative α of 0.10 in an attempt to balance risks for false positive findings (type I errors) and false negatives (type II errors). Reaching statistical significance at $\alpha = 0.10$ (two-sided test) with a power of 0.80 would require 88 (44 treated and 44 control) participants.

RESULTS

Baseline Comparisons of iCBT and TAU-Only Participants

Table 1 displays baseline data for participants and reveals a few small-sized ($d = 0.21$–0.47), significant (urban residence) and non-significant baseline differences (age, migrant status, index violent offense type, somatic anxiety, antisocial cognitions, and SAVRY protective factors) between youths randomized to iCBT+TAU or TAU-only. Except for somatic anxiety and index violent offense type, both empirically unlikely to be related to violent recidivism risk, five of these seven covariates were controlled for in the Cox regression model described below.

Pre- to Post-treatment Comparisons

Pre- to post-treatment reductions in self-reported conduct problems, aggression, and antisocial cognitions are presented in **Table 2**. Both iCBT+TAU and TAU-only youth reported significant small-to-large effect-size reductions on all six measures, except for reactive aggression for iCBT+TAU participants. No between-group or interaction effects were found using mixed-design ANOVAs except for proactive aggression where iCBT+TAU participants reported a tendency toward more self-reported improvement [$F_{(1,70)} = 2.99$, $p < 0.10$].

Follow-Up: Aggression at 12 Months

The mean DSM-5 CD aggressive symptom score was 4.27 ($SD = 3.55$, range 0–11). We found no significant difference in CD symptom scores between iCBT+TAU and TAU-only participants ($t = 0.39$, $df = 62$, $p = 0.70$, $d = 0.09$) as reported by the youth themselves or their social service case managers (see **Table 3**).

Follow-Up: Registered Criminal Recidivism at 12 and 24 Months

Violent reconviction rate differences were small but non-significantly higher for iCBT+TAU youth at 12 months (34 vs. 23%, $d = 0.30$, 95% CI: −0.24 to 0.84) and 24 months (50 vs. 40%, $d = 0.23$, 95% CI: −0.25 to 0.72). Similarly, any reconviction differences at 12 and 24 months were marginal to small and non-significant.

There were small-sized, non-significant differences in number of offense counts favoring TAU-only over iCBT+TAU youth at 12 months (Mann-Whitney $U = 738.00$, $p = 44$, $d = 0.17$), and at 24 months ($U = 712.00$, $p = 0.32$, $d = 0.22$).

We used Cox proportional hazards regression to compare recidivism rates for iCBT+TAU and TAU-only subjects for the entire follow-up period ($M = 42$ months, $SD = 8$, range 27–54 months). Controlling for five small-sized covariate differences at baseline, iCBT+TAU compared to TAU-only participants had slightly, non-significantly higher risk of violent recidivism [adjusted Hazard Ratio (aHR) = 1.57; 95% CI: 0.78 to 3.16] and negligibly lower for any recidivism (aHR = 0.89; 95% CI: 0.51 to 1.54), respectively. Corresponding estimates for the initial, unadjusted Cox regression model were essentially the same (data not shown).

TABLE 2 | Pre- to post-treatment comparisons (within-group) of self-reported conduct problems, aggression, and antisocial cognitions in an RCT of an individualized CBT intervention (iCBT) plus treatment-as-usual (TAU) vs. TAU-only among serious, young male violent offenders.

Variable	iCBT participants		Effect size for difference Cohen's *d*	TAU participants		Effect size for difference Cohen's *d*
	Pre-treatment	Post-treatment		Pre-treatment	Post-treatment	
Youth Self-Report, oppositional defiant[a] (0–10), *M, SD* (*n*)	3.71, 2.75 (38)	1.27, 1.01 (33)	**0.94*****	3.91, 2.24 (43)	1.33, 0.92 (40)	**1.12*****
Youth Self-Report, conduct problems[a] (0–28), *M, SD* (*n*)	7.53, 4.90 (38)	1.36, 1.85 (33)	**1.40*****	6.79, 3.64 (43)	1.10, 1.34 (40)	**1.64*****
Aggression, total[b] (0–42), *M, SD* (*n*)	11.18, 7.37 (38)	8.34, 6.27 (32)	**0.62*****	10.07, 6.24 (43)	7.75, 6.77 (40)	*0.39**
Aggression, proactive[b] (0–20), *M, SD* (*n*)	5.18, 4.19 (38)	3.81, 3.46 (32)	**0.65*****	4.65, 3.27 (43)	3.78, 3.39 (40)	*0.23*^{ns}
Aggression, reactive[b] (0–12), *M, SD* (*n*)	3.55, 1.91 (38)	3.37, 1.79 (32)	0.02^{ns}	3.28, 1.94 (43)	2.67, 2.09 (40)	*0.26*^{ns}
Antisocial cognitions[c] (40–240), *M, SD* (*n*)	121.50, 43.50 (38)	108.44, 41.98 (32)	*0.34*§	113.79, 28.27 (43)	105.37, 40.36 (40)	*0.27*§

(n) denotes number of subjects with data in each treatment condition. Following Cohen (22): Bolded figures denote d > 0.50, equal to a "moderate" or larger effect size, italicized figures denote 0.20 < d < 0.50, equal to a "small" effect size.

[a] DSM diagnosis-oriented subscale, past 6 months.

[b] No specified measurement period; asks about how well the 21 statements agree with how you are.

[c] Self-reported antisocial cognitive distortions, past 6 months according to How I think, higher scores indicate more distortions.

[ns] Paired t-test, p > 0.10, [§]Paired t-test, p < 0.10, [*]Paired t-test, p < 0.05, [***]Paired t-test, p < 0.001.

TABLE 3 | Aggressive symptoms and register-based criminal reconvictions at follow-up in an RCT of an individualized CBT intervention (iCBT) plus treatment-as-usual (TAU) vs. TAU-only among convicted serious, young male violent offenders.

Outcome	12-month follow-up			24-month follow-up		
	iCBT participants (*N* = 38)	TAU participants (*N* = 43)	Effect size difference Cohen's *d* (95% CI)	iCBT participants (*N* = 38)	TAU participants (*N* = 43)	Effect size difference Cohen's *d* (95% CI)
Aggressive DSM-5 CD symptom score[a] (0–16), *M, SD*	4.46, 3.67 (28)[b]	4.11, 3.50 (36)[b]	0.10 (−0.40 to 0.60)	NA	NA	NA
Criminal reconvictions						
Violent crime[c], % (*n*)	34% (13)	23% (10)	*0.30 (−0.24 to 0.84)*	50% (19)	40% (17)	*0.23 (−0.25 to 0.72)*
Any crime, % (*n*)	71% (27)	65% (28)	0.15 (−0.37 to 0.67)	71% (27)	74% (32)	−0.09 (−0.63 to 0.45)
No. of offense count[d], *M, SD*	5.61, 8.95	3.49, 4.31	*0.31 (−0.13 to 0.74)*	7.82, 9.05	5.14, 6.35	*0.35 (−0.78 to 0.10)*

Following Cohen (22): Italicized figures denote 0.20 < d< 0.50, a "small" effect size.

[a] Summary score of eight possible DSM-5 Conduct Disorder symptoms scored 0 = never, 1 = 1–2 times or 2 = 3+ times that the participant had acted accordingly during the past 12 months. Based on masked researcher interviews with each participant's social service case manager, the youth himself or both.

[b] Figures within parentheses denote number of subjects with data in each treatment condition.

[c] Included (attempted) homicide, aggravated assault, (aggravated) robbery, (attempted/aggravated) rape, and (aggravated) arson. However, no participants were reconvicted of (attempted) homicide or (attempted/aggravated) rape during follow-up.

[d] Defined as total number of all new counts across all court sentencing occasions during the entire follow-up.

Completer Analyses

Despite the best efforts of the contributing therapists and their supervisor, only 15 of 38 youths (39%) randomized to iCBT finished enough sessions (15 or more) to be considered completers. Regarding baseline characteristics likely to affect treatment adherence, iCBT completers were moderately but non-significantly older than TAU-only youth ($M = 18.1$; $SD = 1.1$ vs. $M = 17.7$, $SD = 0.7$; $d = 0.51$; 95% CI: −0.09 to 1.10), and had substantially less ADHD symptoms ($M = 2.00$, $SD = 2.36$ vs. $M = 3.58$, $SD = 1.99$, $d = -0.76$; 95% CI: −1.36 to −0.15) and oppositional defiant symptoms than TAU youth ($M = 2.33$, $SD = 2.47$ vs. $M = 3.91$, $SD = 2.54$, $d = -0.63$, 95% CI: −1.22 to −0.03). Finally, iCBT completers had moderately but non-significantly more SAVRY protective factors compared to TAU-only youth ($M = 3.73$, $SD = 1.22$ vs. $M = 2.84$, $SD = 1.82$, $d = 0.53$, 95% CI: −0.07 to 1.12). There were no other meaningful differences between iCBT completers and TAU-only youth on the remaining baseline measures.

Regarding criminal reconvictions, 20% ($n = 3$) of completing iCBT participants vs. 23% ($n = 10$) of TAU-only youth recidivated in a violent crime within 12 months ($d = -0.11$, 95% CI: −0.94 to 0.72). Corresponding figures for any crime within 12

months was 60% for iCBT completers ($n = 9$) and 65% ($n = 28$) for TAU-only participants ($d = -0.14$, 95% CI: −0.88 to 0.61). At 24 months, 33% ($n = 5$) of iCBT completers vs. 40% ($n = 17$) of TAU-only participants had been reconvicted for a violent crime ($d = -0.16$, 95% CI: −0.92 to 0.59). Correspondingly, within 24 months, 53% ($n = 9$) of iCBT completers and 74% ($n = 32$) of TAU-only participants had recidivated in any crime ($d = -0.40$, 95% CI: −1.16 to 0.36).

Finally, for the full follow-up, Cox regression modeling suggested marginal to small, non-significant, risk reductions for violent reconvictions (aHR = 0.85; 95% CI: 0.28 to 2.55) or any reconviction (aHR = 0.64; 95% CI: 0.28 to 1.45) when comparing iCBT completers with TAU-only participants.

DISCUSSION

Concerned by the limited support for the effectiveness of available group-based psychological interventions in residential care for serious violent young offenders, we investigated the potential effectiveness of the *addition of an individualized CBT intervention* to TAU. A nationwide consecutive sample of 81 youths were randomized to iCBT+TAU or TAU-only in a five-site ecological setting in Sweden. There were three main findings. First, we found substantial pre- to post-treatment improvements on self-reported conduct problems, aggression scores and antisocial cognitions for both iCBT+TAU and TAU-only youth, but no meaningful differences between treatment arms. Second, in intent-to-treat analyses, we were unable to statistically ascertain risk-reducing effects of iCBT treatment on aggression scores at 12 months or on registered reconvictions in violent or any crime at fixed 12- and 24-month follow-ups. Neither did we find any risk-reductions effects of iCBT when looking at the full follow-up period, or on number of conviction counts at 12- and 24-months following release to the community. Third, although complementary per-protocol analyses suggested negligible to small effects favoring iCBT *completers* over TAU youth, these comparisons were also non-significant.

We conclude that an individualized CBT intervention for medium-to-high risk young male violent offenders in residential treatment, focusing on cognitive self-control, and relapse prevention, was insufficient to reduce aggression and criminal reconvictions over and above group-based TAU treatments. iCBT included components known to be associated with positive outcomes, including relapse prevention, focus on interpersonal skills, and homework assignments [e.g., (5, 55)], but may have been insufficiently long and intensive to have desired impact. No feasibility or pilot studies with iCBT were done before the RCT. Because the full iCBT protocol had not been tested beforehand, there is a risk that the manual was not instructive and supportive enough for the therapists or that the training and supervision of therapists was inadequate. Further, serious violent young offenders are characterized by many criminogenic risk factors across multiple risk areas; hence, this population probably needs several different but integrated interventions to prevent reoffending and establish a prosocial life [cf. (12)]. For instance, pharmacological treatment might help clients with impulsivity and emotional dysregulation, and vocational training and social support may be necessary to establish and maintain a prosocial lifestyle. Finally, the study design with both treated and control youth in the same residential homes and cross-facility variability in TAU treatment may have hindered satisfactory integration of iCBT and TAU interventions. This, in turn, may have resulted in poorer iCBT effectiveness.

Potentially effective pharmacological treatment with central stimulants for ADHD, mood stabilizers, and medications against drug craving are substantially more common in residential care today than in 2003–2006. Unless considered in study design and analyses, their use may complicate inferences about possible effects of psychological interventions, for example by leveling out the outcomes of experimental and control groups. Although other studies reveal small possible changes in the prevalence of substantial psychiatric (co)morbidities over time [e.g., (56)], we are unaware of temporal sample composition changes that could affect external validity of the present results.

Proper program implementation is crucial for effectiveness [e.g., (57)]. For example, Helmond et al. (58) argued that the low to moderate treatment integrity they found for the EQUIP program, a CBT intervention common in juvenile correctional facilities in North America, Australia, and Europe (59) could, at least partly, explain the lack of recidivism-reducing effect in their Dutch study. Systematic use of feasibility or pilot studies could be a way to ensure that clinical settings are ready for an effectiveness trial (60). Other methods for monitoring fidelity during implementation and evaluation of interventions in real-world settings include monitoring clients' homework production, and video- or audio monitoring of treatment sessions to assure therapist adherence to manuals, protocols, and treatment principles. In an RCT of Multisystemic Therapy (MST) effectiveness (61), for non-residential adolescent offenders in Sweden, Sundell et al. (62) found no significant post-treatment differences in problem behaviors between MST and TAU participants. They also reported lower scores than previous studies on the MST treatment fidelity measurement (TAM). Since effectiveness differences across participating sites were unrelated to TAM scores, these authors did not attribute the lack of MST effectiveness solely to site effects and program immaturity in terms of TAM-scores. Instead, Sundell et al. (62) suggested the potential validity threat of *TAU variability* (63–66) as an alternative explanation for similar improvements among treatment and control subjects. On a related note, transfer study investigators of MST, an intervention for youth developed in the USA (62, 67) also argued that TAU may be more potent in countries with stronger focus on tax-funded, general child welfare systems such as Sweden and some other European countries. A stronger relative effect of TAU in Sweden would make it more difficult to uncover potential effects of a complementary intervention like iCBT. Since TAU in the current study involved incarceration for a substantial time, the iCBT intervention may have been too short and not intensive enough to exert impact beyond TAU.

Finally, the observed pre- to post-intervention improvements in this study were not reflected in the high recidivism rates found for both groups. This aligns with previous findings that

short-term reductions in individual criminogenic risk factors often fail to produce reduced recidivism after release (68–70). It may be that maintenance of possible individual changes achieved in treatment requires sufficient support following release also on reasonable conditions in terms of housing, studies or work, and prosocial interpersonal relations.

LIMITATIONS AND STRENGTHS

Even with the rather brief iCBT intervention, less than half of those randomized eventually received the full intended dose. Consistent with prior studies [e.g., (71–73)], participants dropping out of iCBT treatment before completion of the full treatment (15+ sessions) had substantially higher risk of reoffending compared to TAU-only controls (data not shown). This finding suggests *dose and dropout* issues, or the importance of receiving an adequate, planned amount of treatment to avoid the risk of harming vulnerable individuals. We had no systematic measurements of initial motivation to engage in treatment; a predictor of treatment attrition among young offenders (74). Notably, treatment completers had significantly less (medium effects) ADHD and oppositional defiant symptoms compared to non-completers. This suggests that such symptoms may increase attrition risk and need consideration in treatment planning. The iCBT manual provided specific approaches for handling dropout risk, for instance by using motivational interviewing strategies with youth signaling lowered motivation. However, despite being addressed in continuous supervision of iCBT treatment providers, this may have been insufficient to secure treatment completion.

Second, systematic reviews of treatment of young offenders suggest that effectiveness studies (i.e., in regular clinical settings) more often suffer from attrition, insufficient descriptions of implementation or poor quality of the latter than do efficacy studies[in more specialized, research-oriented settings; e.g., (17, 75)]. Suboptimal *treatment integrity* could be a limitation also in this study. Contributing iCBT therapists were expected to participate in repeated supervision in person and by email and were encouraged to contact the supervisor whenever needed. However, perhaps inevitably with high-risk serious violent youth clients, some of them experienced difficulties with adhering to the treatment process. Based on the suggested non-significant trend toward marginal or small positive effects for iCBT completers compared to TAU-only controls, treatment non-completion may have influenced overall results.

Third, designing studies based on well-informed, careful calculation of *statistical power* is important to avoid random errors due to data variability [e.g., (76)]. Although we tried to balance the risk of type I and II errors by using the less conservative alpha level of 0.10, our study was underpowered, primarily due to an initial overestimation of possible treatment effects and client attrition. Nevertheless, the iCBT effects suggested here, negligible or favoring the TAU condition, argue against further testing of the current iCBT format as an add-on to group-based interventions.

Strengths of the study include high ecological validity (conducted in a real-world clinical setting, with few exclusion criteria and with local therapists), contrasting iCBT with an active and relevant comparator (TAU) used in most youth residential treatment facilities in Sweden, and including multiple sources of information; masked clinician ratings, self-reports, and nationwide crime register data.

CONCLUSION

A complementary, individualized 15–20-session CBT intervention focusing problem-solving, cognitive self-control, and relapse prevention for serious, young male violent offenders in residential treatment in Sweden was insufficient to reduce aggression and criminal reconvictions during the 24 months following release, beyond group-based TAU. Intent-to-treat effect estimates were imprecise due to restricted sample size and considerable attrition. However, suggested negligible or negative effects argues against further testing of the iCBT format as a complement to evidence-based group interventions, although firm conclusions cannot be drawn given the present limitations.

Besides drawing attention to the relative effectiveness of comparison interventions, our findings underscore the need for more effective, comprehensive, and individualized interventions for serious young violent offenders in residential treatment. Further integration of psychological and psychiatric treatment [cf. (56)], well-performed program implementation, and effective strategies for maintaining treatment integrity are likely to benefit these vulnerable and costly high-risk youth and society alike.

DATA AVAILABILITY STATEMENT

The dataset presented in this article is not readily available since it contains sensitive details about the participants. Requests to access the dataset should be directed to Martin Lardén, martin.larden@kriminalvarden.se.

ETHICS STATEMENT

The study was reviewed and approved by the Regional Ethics Review Board in Stockholm, Sweden. Written informed consent to participate was provided by the youth himself and, for participants younger than 18 years, also from parent(s)/legal guardians.

AUTHOR CONTRIBUTIONS

ML and NL designed the study. ML coordinated the data collection, conducted the data analyses, and drafted the initial manuscript. All authors reviewed the manuscript for important intellectual content and helped shape interpretations and the final manuscript.

FUNDING

Financial support was generously provided by the Swedish National Board of Institutional Care (grant 1.2002/0024.3). The funder had no influence on study design, analyses, conclusions, or decision to publish. The study was approved

by the Regional Ethics Review Board in Stockholm, Sweden (dnr: 03-315).

ACKNOWLEDGMENTS

We thank participating youth, therapists, and residential homes for their time and dedication. A special thank you to research assistant Ingrid Freij for skills, integrity, and stamina in coordinating the project and for participant baseline assessments.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.670957/full#supplementary-material

REFERENCES

1. World Health Organisation. *Global Status Report on Violence Prevention.* Geneva: World Health Organisation (2014).
2. National Council for Crime Prevention. *The Swedish Crime Survey 2019.* Stockholm: National Council of Crime Prevention (2019).
3. Morgan RE, Truman JL. *Criminal Victimization, 2019.* Washington, DC: Bureau of Justice Statistics (2020). Available online at: https://www.bjs.gov/content/pub/pdf/cv19.pdf (accessed October 23, 2020).
4. Morales LA, Garrido V, Sánchez-Meca J. *Treatment Effectiveness in Secure Corrections of Serious (Violent or Chronic) Juvenile Offenders*. Stockholm: National Board of Crime Prevention (2010).
5. Jolliffe D, Farrington DP. *A Systematic Review of the National and International Evidence on the Effectiveness of Interventions With Violent Offenders*. Ministry of Justice (2007).
6. Richards K. *What Makes Juvenile Offenders Different From Adult Offenders? Trends and Issues in Crime and Criminal Justice, 409.* Canberra, ACT: Australian Institute of Criminology (2011). Available online at: https://www.aic.gov.au/sites/default/files/2020-05/tandi409.pdf (accessed September 21, 2020).
7. Assink M, Van der Put CE, Hoeve M, De Vries SLA, Stams GJJM, Oort FJ. Risk factors for persistent delinquent behavior among juveniles: a metaanalytic review. *Clin Psychol Rev.* (2015) 42:47–61. doi: 10.1016/j.cpr.2015.08.002
8. Aizer A, Doyle JJ. Juvenile incarceration, human capital, and future crime: evidence from randomly assigned judges. *Q J Econ.* (2015) 130:759–804. doi: 10.1093/qje/qjv003
9. Cécile M, Born M. Intervention in juvenile delinquency: danger of iatrogenic effects? *Child Youth Serv Rev.* (2009) 31:1217–21. doi: 10.1016/j.childyouth.2009.05.015
10. De Swart JJW, Van den Broek H, Stams GJJM, Asscher JJ, Van der Laan PH, Holsbrink-Engels GA, et al. The effectiveness of institutional youth care over the past three decades: a meta-analysis. *Child Youth Serv Rev.* (2012) 34:1818–24. doi: 10.1016/j.childyouth.2012.05.015
11. Barnert ES, Dudovitz R, Nelson BB, Coker TR, Biely C, Li N, et al. How does incarcerating young people affect their adult health outcomes? *Pediatrics.* (2017) 139:e20162624. doi: 10.1542/peds.2016-2624
12. Souverein F, Dekkers T, Bulanovaite E, Doreleijers T, Hales H, Kaltiala-Heino R, et al. Overview of European forensic youth care: towards an integrative mission for prevention and intervention strategies for juvenile offenders. *Child Adolesc Psychiatry Ment Health.* (2019). 13:6. doi: 10.1186/s13034-019-0265-4
13. Dishion TJ, Tipsord JM. Peer contagion in child and adolescent social and emotional development. *Annu Rev Psychol.* (2011) 62:189–214. doi: 10.1146/annurev.psych.093008.100412
14. Sawyer AM, Borduin CM, Dopp AR. Long-term effects of prevention and treatment on youth antisocial behavior: a meta-analysis. *Clin Psychol Rev.* (2015) 42:130–44. doi: 10.1016/j.cpr.2015.c06.009
15. Landenberger NA, Lipsey MW. The positive effects of cognitive-behavioral programs for offenders: a meta-analysis of factors associated with effective treatment. *J Exp Criminol.* (2005) 1:451–76. doi: 10.1007/s11292-005-3541-7
16. Armelius BÅ, Andreassen TH. Cognitive-behavioral treatment for antisocial behavior in youth in residential treatment. *Cochrane Database Syst Rev.* (2007) 2007:CD005650. doi: 10.1002/14651858.CD005650.pub2
17. Koehler JA, Lösel FA, Akoensi TD, Humphreys DK. A systematic review and meta-analysis on the effects of young offender treatment programs in Europe. *J Exp Criminol.* (2013) 9:19–43. doi: 10.1007/s11292-012-9159-7
18. Hoogsteder LM, Stams GJJM, Figge MA, Changoe K, Van Horn JE, Hendriks J, et al. A meta-analysis of the effectiveness of individually oriented cognitive behavioral treatment (CBT) for severe aggressive behavior in adolescents. *J Foren Psychiatry Psychol.* (2015) 26:22–37. doi: 10.1080/14789949.2014.971851
19. Bonta J, Andrews DA. *Psychology of Criminal Conduct. 6th ed*. New York, NY: Routledge (2017). doi: 10.4324/9781315677187
20. Nordén E. *Utvecklingen av sluten ungdomsvård 1999-2014 (in Swedish: The Development of Closed Institutional Care 1999-2014)*. Stockholm: Brottsförebyggande rådet (BRÅ) Swedish National Council of Crime Prevention (2015).
21. Pettersson T. Recidivism among young males sentenced to prison and youth custody. *J Scand Stud Criminol Crime Prev.* (2010) 11:151–69. doi: 10.1080/14043858.2010.523554
22. Cohen J. *Statistical Power Analysis for the Behavioral Sciences. 2nd ed.* New York, NY: Lawrence Erlbaum Associates (1988).
23. Lardén M. *Terapeutmanual för IKBT. (in Swedish: Therapist Manual for ICBT*). Unpublished Manual. Stockholm: Karolinska institutet (2003).
24. Lipsey MW, Wilson DB. Effective interventions for serious juvenile offenders: a synthesis of research. In: Loeber R, Farrington DP, editors. *Serious and Violent Juvenile Offenders: Risk Factors and Successful Interventions*. Thousand Oaks, CA: Sage publications (1998) p. 313–45.
25. Dowden C, Andrews DA. What works in young offender treatment: a meta-analysis. *Forum Corrections Res.* (1999) 11:21–4.
26. Andreassen T. *Institutionsbehandling av ungdomar. Vad säger forskningen (in Swedish: Residential Youth Care: What Does the Research Say?)*. Stockholm: Gothia (2003).
27. Andrews DA, Bonta J. *Psychology of Criminal Conduct, 2nd ed*. Cincinnati, OH: Anderson Publishing (1998).
28. Lardén M. *Från brott till genombrott. Kognitiv beteendeterapi för tonåringar med psykosociala problem. (in Swedish: From Law-Breaking to Break-Through. Cognitive Behavior Therapy for Adolescents with Psychosocial Problems).* Stockholm: Gothia (2002).
29. Goldstein AP, Glick B, Gibbs JC. *Aggression Replacement Training: A Comprehensive Intervention for Aggressive Youth. Rev. ed.* Champaign, IL: Research Press (1998).
30. Achenbach TM, Rescorla LA. *Manual for the ASEBA School-Age Forms and Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth and Families (2001).
31. Sisteré ML, Domènech Massons JM, Pérez RG, Ascaso LE. Validity of the DSM-oriented scales of the Child Behavior Checklist and Youth Self-Report. *Psicothema.* (2014) 26:364–71. doi: 10.7334/psicothema2013.342
32. Colins OF. Psychometric properties and clinical usefulness of the Youth Self-Report DSM-oriented scales: a field study among detained male adolescents. *Int J Environ Res Public Health.* (2016). 13:932. doi: 10.3390/ijerph13090932
33. Broberg AG, Ekeroth K, Gustafsson PA, Hägglöf B, Ivarsson T, Larsson B. Self-reported competences and problems among

Swedish adolescents: a normative study of the YSR. *Eur Child Adolesc Psychiatry*. (2001) 10:186–93. doi: 10.1007/s007870170025
34. Brown K, Atkins MS, Osborne ML, Milnamow M. A revised teacher rating scale for reactive and proactive aggression. *J Abnorm Child Psychol.* (1996) 24:473–80. doi: 10.1007/BF01441569
35. Barriga AQ, Gibbs JC, Potter GB, Liau AK. *Test manual for the How I Think (HIT) Questionnaire*. Champaign, IL: Research Press (2001).
36. Lardén M, Melin L, Holst U, Långström N. Moral judgment, cognitive distortions and empathy in incarcerated delinquent and community control adolescents. *Psychol Crime Law.* (2006) 12:453–62. doi: 10.1080/10683160500036855
37. Gibbs JC, Basinger KS, Fuller D. *Moral Maturity: Measuring the Development of Sociomoral Reflection*. Hillsdale, NJ: Lawrence Erlbaum Associates (1992).
38. Palmer EJ, Hollin CR. Social competence and sociomoral reasoning in young offenders. *Appl Cogn Psychol.* (1999) 13:79–87. doi: 10.1002/(SICI)1099-0720(199902)13:1<79::AID-ACP613>3.0.CO;2-Q
39. Palmer EJ, Hollin CR. Sociomoral reasoning, perceptions of parenting and self-reported delinquency in adolescents. *Appl Cogn Psychol.* (2001) 15:86–100. doi: 10.1002/1099-0720(200101/02)15:1<85::AID-ACP691>3.3.CO;2-Y
40. Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. *Psychol Bull.* (1979) 86:420–8. doi: 10.1037/0033-2909.86.2.420
41. Borum R, Bartel P, Forth A. *Structured Assessment of Violence Risk in Youth (SAVRY).* (2002). San Diego, CA: University of South Florida.
42. Pullman LE, Leroux EJ, Motayne G, Seto MC. Examining the developmental trajectories of adolescent sexual offenders. *Child Abuse Negl.* (2014) 38:1249–58. doi: 10.1016/j.chiabu.2014.03.003
43. Seto MC, Lalumière ML. What is so special about male adolescent sexual offending? A review and test of explanations through meta-analysis. *Psychol Bull.* (2010) 136:526–75. doi: 10.1037/a0019700
44. Thompson MP, Brooks Kingree J, Zinzow H, Swartout J. Time-varying risk factors and sexual aggression perpetration among male college students. *J Adolesc Health.* (2015) 57:637–42. doi: 10.1016/j.jadohealth.2015.08.015
45. Worling JR, Långström N. Assessment of criminal recidivism risk with adolescents who have offended sexually: a review. *Trauma Violence Abuse.* (2003) 4:341–62. doi: 10.1177/1524838003256562
46. Hart SD, Cox DN, Hare RD. *Manual for the Hare Psychopathy Checklist-Revised: Screening version (PCL:SV)*. Toronto, ON: Multi-Health Systems. (1995).
47. Hare RD. *Manual for the Hare Psychopathy Checklist–Revised*. Toronto, ON: Multi-Health Systems (1991). doi: 10.1037/t01167-000
48. Skeem JL, Polaschek DLL, Patrick CJ, Lilienfeld SO. Psychopathic personality: bridging the gap between scientific evidence and public policy. *Psychol Sci Public Interest.* (2011) 12:95–162. doi: 10.1177/1529100611426706
49. Polaschek DLL, Daly TE. Treatment and psychopathy in forensic settings. *Aggress Violent Behav.* (2013) 18:592–603. doi: 10.1016/j.avb.2013.06.003
50. Thornton LC, Frick PJ, Shulman EP, Ray JV, Steinberg L, Cauffman E. Callous-unemotional traits and adolescents' role in group crime. *Law Hum Behav.* (2015) 39:368–77. doi: 10.1037/lhb0000124
51. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders. 5th ed*. Washington, DC: American Psychiatric Association (2013). doi: 10.1176/appi.books.9780890425596
52. Wilson D. *Practical Meta-Analysis Effect Size Calculator.* (2001). Available online at: https://campbellcollaboration.org/escalc/html/EffectSizeCalculator-Home.php (accessed November 5, 2020).
53. Lipsey MW, Wilson DB. *Practical Meta-Analysis*. Thousand Oaks, CA: Sage Publications (2001).
54. Neath I. *Within-Subject Calculator.* (2020). Available online at: https//:memory.psych.mun.ca/models/stats/effects_size.shtml (accessed January 5, 2021).
55. Papalia N, Spivak B, Daffern M, Ogloff JRP. A meta-analytic review of the efficacy of psychological treatments for violent offenders in correctional and forensic mental health settings. *Clin Psychol Sci Pract*. (2019) 26:e12282. doi: 10.1111/cpsp.12282
56. Beaudry G, Rongqin Y, Långström N, Fazel S. Mental disorders among adolescents in juvenile detention and correctional facilities: an updated systematic review and metaregression analysis. *J Am Acad Child Adolesc Psychiatry.* (2020) 60:46–60. doi: 10.1016/j.jaac.2020.01.015
57. Kendall PC, Frank HE. Implementing evidence-based treatment protocols: flexibility within fidelity. *Clin Psychol.* (2018). 25:12271. doi: 10.1111/cpsp.12271
58. Helmond PE, Overbeek GJ, Brugman D. An examination of program integrity and recidivism of a cognitive behavioral program for incarcerated youth in The Netherlands. *Psychol Crime Law.* (2015) 21:330–46. doi: 10.1080/1068316X.2014.989164
59. Gibbs JC, Potter GB, Goldstein AP. *The EQUIP Program: Teaching Youth to Think and Act Responsibly Through a Peer-Helping Approach*. Champaign, IL: Research Press (1995).
60. Henggeler SW, Melton GB, Brondino MJ, Shearer DG. Multisystemic therapy with violent and chronic juvenile offenders and their families: the role of treatment fidelity in successful dissemination. *J Consult Clin Psychol.* (1997) 65:821–33. doi: 10.1037/0022-006X.65.5.821
61. Henggeler SW, Sheidow AJ, Lee T. Multisystemic treatment (MST) of serious clinical problems in youths their families. In: Springer DW, Roberts AR, editors. *Handbook of Forensic Social Work with Victims and Offenders: Assessment, Treatment, and Research*. New York, NY: Springer (2007). p. 301–22.
62. Sundell K, Hansson K, Löfholm CA, Olsson T, Gustle LH, Kadesjö C. The transportability of multisystemic therapy to Sweden: short-term results from a randomized trial of conduct-disordered youths. *J Fam Psychol.* (2008). 22:550–60. doi: 10.1037/a0012790
63. Olsson TM, Långström N, Skoog T, Andrée Löfholm C, Brolund A, Nykänen P, et al. Preventing recidivism: systematic review and meta-analysis of non-institutional psychosocial interventions for juvenile offenders aged. *J Consult Clin Psychol.* (2021) 89:514–27.
64. Santa Ana EJ, Martino SA, Nich C, Frankforter TL, Carroll KM. What is usual about'treatment-as-usual'? Data from two multisite effectiveness trials. *J Subst Abuse Treat.* (2008) 35:369–79. doi: 10.1016/j.jsat.2008.01.003
65. Burns T. End of the road for treatment-as-usual studies. *Br J Psychiatry.* (2009) 195:5–6. doi: 10.1192/bjp.bp.108.062968
66. Andrée Löfholm C, Brännström L, Olsson M, Hansson K. Treatment-as-usual in effectiveness studies: what is it and does it matter? *Int J Soc Welf.* (2013) 22:25–34. doi: 10.1111/j.1468-2397.2012.00870.x
67. Vermeulen KM, Jansen, DEMC, Knorth EJ, Buskens E, Reijneveld SA. Cost-effectiveness of multisystemic therapy versus usual treatment for young people with antisocial problems. *Crim Behav Ment Health.* (2017) 27:89–102. doi: 10.1002/cbm.1988
68. Serin RC, Lloyd CD, Helmus L, Derkzen DM, Luong D. Does intra-individual change predict offender recidivism? Searching for the Holy Grail in assessing offender change. *Aggress Violent Behav.* (2013) 18:32–53. doi: 10.1016/j.avb.2012.09.002
69. O'Brien K, Daffern M. Treatment gain in violent offenders: the relationship between proximal outcomes, risk reduction and violent recidivism. *Psychiatr Psychol Law.* (2017). 24:244–58. doi: 10.1080/13218719.2016.1209804
70. Yesberg JA, Polaschek DLL. How does offender rehabilitation actually work? Exploring mechanisms of change in high-risk treated parolees. *Int J Offender Ther Comp Criminol.* (2019) 63:2672–92. doi: 10.1177/0306624X19856221
71. Olver ME, Stockdale KC, Wormith JS. A meta-analysis of predictors of offender treatment attrition and its relationship to recidivism. *J Consult Clin Psychol.* (2011) 79:6–21. doi: 10.1037/a0022200
72. McMurran M, Theodosi E. Is treatment non-completion associated with increased reconviction over no treatment? *Psychol Crime Law.* (2007) 13:333–43. doi: 10.1080/10683160601060374
73. Lardén M, Nordén E, Forsman M, Långström N. Effectiveness of Aggression Replacement Training (ART) in reducing criminal recidivism among

convicted adult offenders. *Crim Behav Ment Health.* (2018) 28:476–91. doi: 10.1002/cbm.2092
74. Carl LC, Schmucker M, Lösel F. Predicting attrition and engagement in the treatment of young offenders. *Int J Offender Ther Comp Criminol.* (2020) 64:355–74. doi: 10.1177/0306624X19877593
75. Lipsey MW. The primary factors that characterize effective interventions with juvenile offenders: a meta-analytic overview. *Vict Offender.* (2009) 4:124–47. doi: 10.1080/15564880802612573
76. Akobeng AK. Understanding type I and type II errors, statistical power and sample size. *Acta Paediatr.* (2016) 105:605–9. doi: 10.1111/apa.13384

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

ML designed the CBT intervention, but has not made economic or other gains from royalties, training, or consulting regarding the model.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 24 February 2022
doi: 10.3389/fpsyt.2022.822295

Effects of Implementing the Short-Term Assessment of Risk and Treatability for Mechanical Restraint in a Forensic Male Population: A Stepped-Wedge, Cluster-Randomized Design

Jacob Hvidhjelm[1]*, *Mette Brandt-Christensen*[2], *Christian Delcomyn*[2], *Jette Møllerhøj*[3], *Volkert Siersma*[4] and *Jesper Bak*[1]

[1] Clinical Mental Health and Nursing Research Unit, Mental Health Center Sct Hans, Copenhagen University Hospital – Mental Health Services CPH, Copenhagen, Denmark, [2] Mental Health Centre Sct Hans, Copenhagen University Hospital – Mental Health Services CPH, Copenhagen, Denmark, [3] Head of Centre, Competence Centre for Forensic Psychiatry, Mental Health Centre Sct Hans, Copenhagen University Hospital – Mental Health Services CPH, Copenhagen, Denmark, [4] The Research Unit for General Practice and Section of General Practice, Department of Public Health, University of Copenhagen, Copenhagen, Denmark

OPEN ACCESS

Edited by:
Katarina Howner,
Karolinska Institutet (KI), Sweden

Reviewed by:
Steffen Lau,
Psychiatric University Hospital Zurich, Switzerland
Tella Jemina Lantta,
University of Turku, Finland

***Correspondence:**
Jacob Hvidhjelm
jacob.hvidhjelm@regionh.dk

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: 25 November 2021
Accepted: 31 January 2022
Published: 24 February 2022

Citation:
Hvidhjelm J, Brandt-Christensen M, Delcomyn C, Møllerhøj J, Siersma V and Bak J (2022) Effects of Implementing the Short-Term Assessment of Risk and Treatability for Mechanical Restraint in a Forensic Male Population: A Stepped-Wedge, Cluster-Randomized Design. Front. Psychiatry 13:822295. doi: 10.3389/fpsyt.2022.822295

The assessment and formulation of the risk of violence and other unwanted behaviors at forensic psychiatric facilities have been attempted for decades. Structured professional judgment tools, such as the Short-Term Assessment of Risk and Treatability (START), are among the recent attempts to overcome the challenge of accomplishing these goals. This study examined the effect of implementing START in clinical practice for the most serious adverse events among the target group of severely mentally ill forensic psychiatric inpatients. Results were based on the use of mechanical restraints as an outcome. This study is a pragmatic, stepped-wedge, cluster-randomized controlled trial and was conducted over 5 years. It included eight forensic psychiatric units. Fifty out of 156 patients who had a basic aggression score of more than 0 were included in the study. We found that the rate of mechanical restraint use within the START period were 82% [relative risk (RR) = 0.18], lower than those outside of the START period. Patients evaluated within the START period were also found to have a 36% (RR = 0.64) lower risk of having higher Brøset Violence Checklist scores than patients evaluated outside the START period. Previous studies on START have primarily focused on validation, the predictive capability of the assessment, and implementation. We were only able to identify one study that aimed to identify the benefits and outcomes of START in a forensic setting. This study showed a significant reduction in the chance for inpatients in a forensic psychiatric facility to become mechanically restrained during periods where the START was used as risk assessment.

Keywords: mental health, psychiatry, forensic, coercion, mechanical restraint, risk assessment, Short-Term Assessment of Risk and Treatability

INTRODUCTION

Valid and reliable measures to assess the risk of violence and other challenging behaviors at forensic psychiatric facilities have been in demand for decades, and several structured professional judgment tools have been developed and introduced into clinical practice (1–8). The Short-Term Assessment of Risk and Treatability (START), a 20-item structured professional judgment instrument designed for recurrent clinical assessments within inpatient and community contexts, is among the most recently developed assessment tools (9). The predictive validity of START for several problem behaviors is generally considered good to excellent within a short to moderate timeframe (10–14). The implementation of START in clinical practice to focus on the patient's strengths and vulnerabilities has been assumed to provide enhanced opportunities to predict and prevent severe violence and self-harm. Scientific reports of using START alone or comparing START with other risk assessment tools in secure mental health settings have been published (11, 15–18). Previous research has primarily focused on its validation and predictive ability (19, 20). The most recent study focused on summarizing item values as a single concept, primarily for research purposes (21). To our knowledge, no previous study has highlighted the reduction in mechanical restraint use as an outcome. Since 2010, there has been an increased focus among Danish politicians and health authorities on reducing the use of coercion in hospital psychiatric departments. In 2014, the Danish government ordered a reduction of mechanical restraint use in inpatient settings by half before 2020, signaling that this was considered the most intrusive type of coercion applied. Additionally, it was a political goal that all types of coercion should decrease during this period. Considerable efforts and resources have been applied, leading to a reduction in the use of coercion; however, the overall goal of reducing the use of mechanical restraints by 50% compared to baseline (years 2011–2013) was not fully achieved by the end of 2020 (22). The present study was initiated by implementing START in clinical practice between May 1, 2012, and April 30, 2017, at a large, medium-secure, forensic mental health facility in the Capital Region of Denmark. All forensic psychiatric facilities in Denmark are publicly funded and are subject to public health authorities. This study aimed to examine the effects of START implementation in clinical practice on the most serious adverse events as expressed by the necessity for mechanical restraint use among the target group of severely mentally ill forensic psychiatric inpatients.

MATERIALS AND METHODS

Study Design

Randomized controlled trials are considered the gold standard when evaluating the effectiveness of interventions in the healthcare context. However, randomized controlled trials have some weaknesses in a workplace setting. Therefore, to overcome these challenges, we decided to apply a stepped-wedge, cluster-randomized design, which has some advantages over classic randomized controlled trials in this setting (23, 24). We attempted to overcome some of the difficulties associated with the use of the stepped-wedge design. During our study, it was possible to gradually implement the intervention in all participating units and motivate the staff and patients.

Another gold standard is following the intention-to-treat principle. This is not preferable in a naturalistic scenario, such as ours, because it is not always possible to rescreen the patients within the maximum effect period of START (which we determined to be 6 months). Furthermore, because some units lost key staff members, they could not evaluate patients with START until new key staff members were trained. Therefore, if we had followed the intention-to-treat principle, we would not have been able to evaluate the effect of START; instead, we would have obtained the effect of the ability of the unit to perform START.

This study used the definition of mechanical restraint as defined by Bowers et al. (25) (the use of restraining straps, belts, or other equipment to restrict movement). This definition refers only to the restraint of inpatients at psychiatric hospitals. The following conditions must be present to legally initiate mechanical restraint according to the Danish Mental Health Act (as translated by the authors):

"Mechanical restraint may be used only when necessary to prevent patients from the following: (1) Exposing their body or health or the body or health of others to danger. (2) Pursuing or in any other way grossly molesting fellow patients. (3) Committing significant acts of vandalism" (26).

According to the law in Denmark, all coercive episodes must be reported to the national database for coercion (26).

Other Instruments

Staff Observation Aggression Scale-Revised

All aggressive or violent incidents were systematically recorded using the electronic version of the Staff Observation Aggression Scale-Revised (SOAS-R). The SOAS-R is an instrument that reports damaging or threatening aggressive behaviors toward an object and/or humans. The SOAS-R is completed each time a staff member witnesses aggressive or violent behavior by a patient. The SOAS-R has been tested and validated by several studies (27–29). With the SOAS-R scoring system, the severity of an incidence can be rated from 0 to 22 points; a score >8 is considered severe. The SOAS-R has shown good inter-rater reliability, with kappa values of 0.61–0.74 (27). The SOAS-R has been used in daily clinical practice since 2008. Staff is trained to register a SOAS-R whenever they witness or are themselves exposed to a violent incident. All registrations are entered in an IT system (designed by Frenzs B.V., Nijmegen, the Netherlands).

Brøset Violence Checklist

The Brøset Violence Checklist (BVC) is used to evaluate the presence (score of 1) or absence (score of 0) of six symptoms: confusion, irritability, boisterousness, physical threats, verbal threats, and attacks on objects. According to standard guidelines (30), a total score of 0 (none of these behaviors present) suggests that the risk of violence is low. A score of 1–2 suggests that the risk is moderate and preventive measures should be taken. A score of 3 or more suggests that the risk of violence is high, immediate preventive measures are required, and plans for

managing an attack should be activated (30, 31). The BVC was implemented in 2005 and recorded in patients files on daily basis.

Population and Timeframe

This study was conducted over 5 years, from May 1, 2012, to April 30, 2017, at the Forensic Department of the Mental Health Centre Sct Hans, Mental Health Services, in the Capital Region of Denmark. Ten units comprise the Forensic Department; however, one unit was excluded because it had served as a pilot unit, and one was excluded because it did not use mechanical restraints. The mean number of beds per unit was 9.4 (range, 8–10 beds).

We included all male forensic patients who displayed one or more basic aggressive episodes. A basic aggressive episode is defined as an episode involving a total SOAS-R score of more than 8 during the first month of inclusion in the study. A total of 50 male patients were included. The reason for excluding patients without one or more basic aggressive episodes was associated with applying mechanical restraints. In Denmark, mechanical restraints are only initiated if the patients are aggressive (toward themselves, others, or things). Therefore, if implementing the START would reduce the use of mechanical restraints, then it would only be possible to detect if the patients had aggression issues. To select patients with aggression issues, we selected those who experienced one or more severe aggressive episodes during the first month of inclusion in the study based on the assumption that those would be the ones most at risk for requiring mechanical restraints.

All units admitted both male and female patients. A total of 13 female patients were admitted during the study period (only three with a basic aggressive episode score were in the included eight units). However, they were excluded because they were presumed to have different associations between START and mechanical restraint use compared to the male patients and because they comprised a sample too small for separate analysis.

Sampling and Data Collection

Of the 10 units of the Forensic Department, eight were used for the study. Five units were randomized to step one: beginning the training for key staff to teach them how to screen patients using START on May 22, 2013. Two units were randomized to step two: beginning the training for key staff 1 year later, on May 21, 2014. The last unit began the training for key staff 2.5 years after step two had begun, on September 9, 2016. All data were retrospectively gathered in May 2017 (see **Figure 1**). The included units were randomized by one of the researchers (JB), using the random number generator in the statistics software that was used.

Key staff members (nurses) were trained in leading the START assessment meeting with multidisiplanery staff attending (e.g., nurses, assistant nurses, psychologists, and psychiatrist). The initial START assessment is often more time consuming than the follow-up assessments and therefore there was a natural decrease in the time spent doing a START assessment—from 1.5 h down to 30 min.

The vast majority of patients admitted to a forensic unit is admitted under court order. In Denmark, forensic psychiatry is part of general psychiatry and not a specialty in itself. The overall responsibility for initiating and implementing treatment is placed upon the treating psychiatrist and always happens in collaboration with other staff. A total of 239 patients were admitted during the study period between May 1, 2012, and April 30, 2017. After the first process of excluding patients from both the pilot unit, and the unit that did not use coercive measures, we were left with 169 patients who were assessed for eligibility. Based on the argumentation above, 13 female patients were additionally excluded. The remaining 156 patients were then rated based on their Basic Aggressive Episodes (Basic Aggressive Episode "BAE": episode involving a SOAS-R score >8 during the first month of participation in the study). A total of 50 (36%) patients who displayed one or more BAE were included in the study. The START period began when the patients underwent the first START evaluation, and it proceeded until the patients did not undergo the START evaluation for 6 months. After that time, they began the control period; however, another START period could have begun if another START evaluation had been performed. This procedure resulted in 42 START periods and 92 control periods for these patients (see **Figure 2**).

Outcome Variables

The primary outcome was the occurrence of mechanical restraint use. Secondary outcomes were the total duration (in minutes) of mechanical restraint use, total coercive episodes (number of physical restraint episodes, episodes of acute forced medication, episodes of one to one observation (without patient consent) and mechanical restraint episodes) and the number of BVC scores more than 2 (a score of 3–6 indicated a severe risk of violence within the next 24 h). The BVC scores were determined three times every 24 h. In a Danish context, mechanical restraint is considered the most severe type of coercion, as the use of seclusion rooms is not allowed. Therefore, mechanical restraint was selected as the outcome measure.

We selected mechanical restraint *(coercion)* rather than SOAS-R as our primary outcome measure. The SOAS-R outcome variable is known to have a relative high degree of underreporting (32). As mentioned earlier registration is mandatory by law and therefore we assume much less underreporting on mechanical restraint than on the SOAS-R.

Potential Confounders

Normally, randomization eliminates the effect of potential confounding variables caused by even distribution. To ensure this in our study, we gathered information about the most important potential confounding variables for this group of patients: age, diagnosis, length of hospitalization before study inclusion, and psychoactive substance use.

Previous Study Findings

According to previous studies, younger men required mechanical restraint use more often, and patients diagnosed with schizophrenia or schizotypal and delusional disorders (WHO ICD-10-codes F20-F29) required mechanical restraint use more often (33). Patients required mechanical restraint use more often at the beginning of their hospitalization period (33, 34). Further,

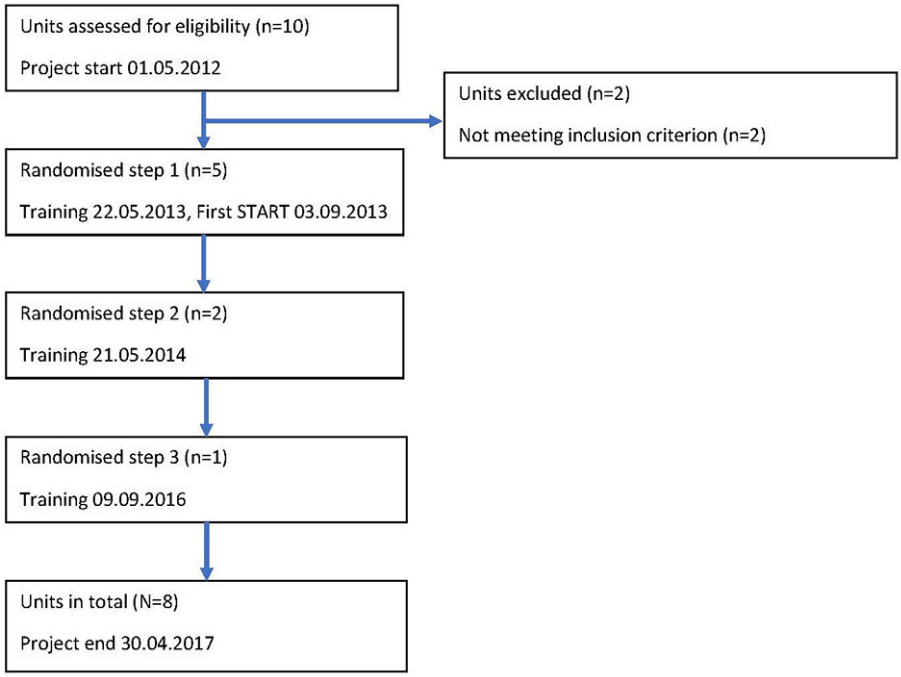


FIGURE 1 | Flowchart for the stepped wedge inclusion of units.

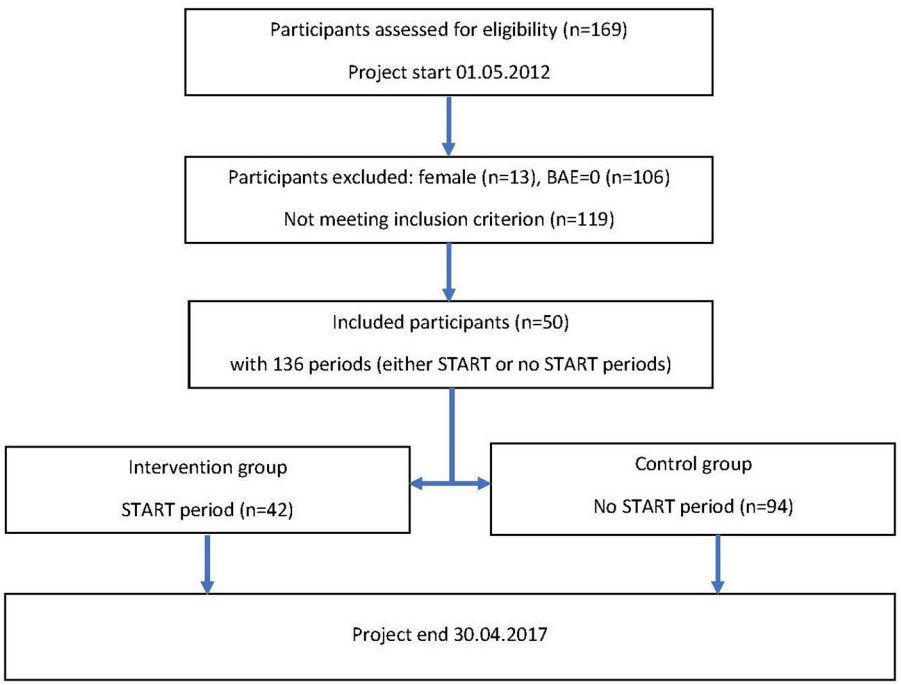


FIGURE 2 | Flowchart of participants.

patients diagnosed with mental and behavioral disorders because of psychoactive substance (WHO ICD-10-codes F10-F19) use experienced mechanical restraint use more often (33).

Data Analysis

Negative binomial regression was performed to assess the incidence of mechanical restraint use when START evaluations

were performed compared to when no START evaluations were performed (35). To assess a cluster effect of "unit", we calculated the proportion of the explained variance attributable to a "unit" as the difference of the coefficients of determination (R^2) of a model with and without "unit" included as categorical variable, divided by the R^2 of a model with "unit" included. The most important covariates were tested for differences in the BAE groups, the START group, and the control group using the chi-squared test. However, because there were both paired and unpaired data, the Cochran-Mantel-Haenszel test was also performed. We analyzed the patient-level data to eliminate the cluster effect. Statistical significance was set at $p < 0.05$. All analyses were performed using SPSS Statistics for Windows version 25.0 (36).

Approval and Ethics

Interventions such as those included in the present study do not require approval from the scientific ethical committee system in Denmark, because it does not include any drugs or biological material and the intervention is regarded part of the natural improvement of care and treatment. The Danish Data Protection Agency (RHP-2013-002, I-Suite no. 02053) approved this study. We received permission from the Center Management and Clinical Management of the Forensic Department to perform this study. We also received permission from the developers of START to use their method during this study (April 1, 2014). This study followed the ethical guidelines for nursing research in the Nordic countries (37) and the recommendations on the legal protection of persons suffering from mental disorders, especially those placed as involuntary patients (38).

RESULTS

Patients who were 28 to 35 years of age had a higher prevalence of having one or more basic aggressive episodes at the beginning of the study period (BAE > 0, 22.0% vs. BAE = 0, 32.1%), but the difference was not significant ($p = 0.20$). Additionally, patients with one or more basic aggressive episodes at the beginning of the study period (basic aggressive episodes >0) had a higher prevalence of schizophrenia, schizotypal or delusional disorder, and other delusional disorders (F20-F29) (BAE > 0, 84.0% vs. BAE = 0, 75.5%), but the difference was not significant ($p = 0.23$) (**Table 1**).

A total of 296 (72.7%) START assessments (on both patients with a BAE score = 0 and BAE above 0) out of 407 was preformed during the study period with a mean of 4.1 month between assessments. One patient had 17 START assessments preformed during the study period.

Patients in the intervention group (START period) had been hospitalized before being included in the study ($p = 0.01$) (**Table 2**). The Cochran-Mantel-Haenszel test results were similar for these patients.

The rate of mechanical restraint use within the START period was 82% lower than that outside the START period [relative risk (RR) = 0.18; 95% confidence interval (CI), 0.08–0.41; $p < 0.01$; $p = 3.01 \times 10–5$]. The results of an adjusted analysis (RR = 0.17; 95% CI, 0.08–0.37; $p < 0.01$; $p = 6.0 \times 10–6$) were similar, indicating that incidence differences could not be explained by confounding factors. The proportion of fit attributable to "unit" was 0.04 (4%) (**Table 3**).

The duration of mechanical restraint use was 99% lower within the START period than outside the START period (RR = 0.01; 95% CI, 0.00–0.01; $p < 0.01$; $p = 2.0 \times 10–14$). The results of an adjusted analysis (RR = 0.002; 95% CI, 0.001–0.006; $p < 0.01$; $p = 0.0 \times 10$-E) were similar, indicating that the incidence difference could not be explained by confounding factors. The proportion of fit attributable to "unit" was 0.01 (1%). The very small RR, could probably be explained by a few patients, mechanical restrained for a long period of time. Therefor, the analyses of duration should not be the primary result (**Table 3**).

The rate of total use of coercion within the START period was 63% lower than that outside the START period [relative risk (RR) = 0.37; 95% confidence interval (CI), 0.19–0.74; $p < 0.01$]. The results of an adjusted analysis (RR = 0.33; 95% CI, 0.19–0.60; $p < 0.00$) were similar, indicating that incidence differences

TABLE 1 | Descriptive statistics of background variables of the whole population.

	BAE = 0 ($n = 106$)		BAE > 0 ($n = 50$)		Total ($N = 156$)		χ^2
	n	%	*n*	%	*N*	%	*p*-value
Age when the patient was included in the study							
<27 years	28	26.4%	16	32.0%	44	28.2%	0.47
28–35 years	34	32.1%	11	22.0%	45	28.8%	0.20
36–45 years	25	23.6%	13	26.0%	38	24.4%	0.74
>45 years	19	17.9%	10	20.0%	29	18.6%	0.76
Diagnoses of schizophrenia, schizotypal and delusional disorders (F20–F29)	80	75.5%	42	84.0%	122	78.2%	0.23
Length of hospitalization before the patient were included in the study (<1 year)	55	51.9%	29	58.0%	84	53.8%	0.48
Diagnoses of psychoactive substance use, primary or secondary (F10–19)	68	64.2%	32	64.0%	100	64.1%	0.99

BAE (Basic Aggressive Episodes) = the sum of SOAS-R scorings above 8, the first month the patient were in the study. Patients with at least one BAE (BAE > 0) was included in the study. χ^2, Chi square test for the difference (Δ) between the BAE = 0 group and the BAE > 0 group.

TABLE 2 | Descriptive statistics of the background variables of the START group and the control group.

	START group ($n = 42$)		Control group ($n = 94$)		Total ($N = 136$)		χ^2
	n	%	*n*	%	*n*	%	*p*-value
Age when the patient was included in the study							
<27 years	11	26.2%	26	27.7%	37	27.2%	0.86
28–35 years	9	21.4%	19	20.2%	28	20.6%	0.87
36–45 years	12	28.6%	28	29.8%	40	29.4%	0.89
>45 years	10	23.8%	21	22.3%	31	22.8%	0.85
Diagnoses of schizophrenia, schizotypal and delusional disorders (F20–F29)	39	92.9%	82	87.2%	121	89.0%	0.33
Length of hospitalization before the patient were included in the study (<1 year)	13	31.0%	51	54.3%	64	47.1%	0.01*
Diagnoses of psychoactive substance use, primary or secondary (F10–19)	25	59.5%	57	60.6%	82	60.3%	0.53

A START period is the day and time of the START rating plus 6 months. A control period is all other periods where the patient is hospitalized. The 50 patients (BAE > 0) had a total of 136 periods and all patients in the START group also was a part of the control group. 22 patients only participated in the control group with 29 periods. χ^2, Chi square test for the difference between the START group and the control group.
$p \leq 0.05$.

TABLE 3 | Effect of START on the outcome variables: mechanical restraint use, total coercion and BVC episodes.

	START group ($n = 42$)		Control group ($n = 94$)		Unadjusted analysis[1] ($N = 136$)				Adjusted analysis[2] ($N = 136$)				Proportion of fit attributable to "unit"[3]
	Rate (#/month)		Rate (#/month)		RR	95% Wald confidence interval of RR		*p*-value	RR	95% Wald confidence interval of RR		*p*-value	
	Mean	SD	Mean	SD		Lower	Upper			Lower	Upper		
MR[4] episodes	0.03	0.10	0.18	0.39	0.18	0.08	0.41	0.00**	0.17	0.08	0.37	0.00**	0.04
Duration in minutes of MR[4] episodes	274	1652	609	1950	0.01	0.00	0.03	0.00**	0.00	0.00	0.01	0.00**	0.01
Total coercive episodes[5]	0.12	0.32	0.39	0.94	0.37	0.19	0.74	0.01*	0.33	0.19	0.60	0.00**	0.01
Number of BVC[6] episodes (>2)	.96	1.38	1.42	1.72	0.64	0.44	0.91	0.01*	0.60	0.43	0.86	0.01**	0.08

[1]*Negative Binominal Regression, Offset = log. to the length of the period, Repeated Subject = Patient ID, Adjusted for Units (cluster effect).*
[2]*Further adjusted for: Age, Diagnoses, Length of hospitalization, and Psychoactive substance use.*
[3]*Proportion of fit attributable to "unit" = the proportion of R2 with and without units (clusters).*
[4]*Mechanical Restraint.*
[5]*Total coercive episodes = number of physical restraint episodes, episodes of acute forced medication, episodes of one to one observation (without patient consent) and mechanical restraint episodes.*
[6]*BVC, Brøset Violence Checklist.*
$p \leq 0.05$.
$p \leq 0.01$.

could not be explained by confounding factors. These results (RR = 0.37 compared to RR = 0.18), indicates that some of the mechanical restraint episodes is converted to a lesser intrusive kind of coercion (which in it self would be a positive result), but not to a degree that impacts the results especially. The proportion of fit attributable to "unit" was 0.01 (1%) (**Table 3**).

Finally, the risk of having a BVC score more than 0 (BVC score >2 indicated a severe risk of violence within the next 24 h) within the START period was 36% lower than that outside the START period (RR = 0.64; 95% CI, 0.44–0.91; $p = 0.01$). The results of an adjusted analysis (RR = 0.60; 95% CI, 0.43–0.86; $p = 0.01$) were similar, indicating that the incidence difference could not be explained by confounding. The proportion of fit attributable to "unit" was 0.08 (8%) (**Table 3**).

DISCUSSION

The stepped-wedge design was chosen for both ethical and practical reasons. Ethical considerations included the absence of equipoise because there is evidence that START will do more

good than harm. Therefore, it would be unethical to withhold its implementation from participants. Practically, the design solved the problem of simultaneous implementation in half the units and many logistical and practical problems (39, 40). Additionally, the outcomes were available from routinely collected data (BVC and SOAS-R) (40). The design also allowed us to include a large number of patients. The clustering of sites confined to one geographical site and the number of sites could have been limitations to the generalizability of the current study (35, 39, 41).

In an ideal world, where the time between START assessments had been possible to keep as recommended in the manual (9), and where key employees that was responsible for arranging START assessments meetings was not ill or had left their position in the department, and that sufficient resources were available so that the team performing the assessment had opportunity to meet. We would have expected to have collected 407 START assessments but collected 296 assessments. It might not even be possible to reach a complesion rate of 73% in this ideal world, as we were able to reach in our naturalistic scenario.

Previous research has primarily focused on the validation and predictive ability of START. Few studies have focused on its implementation and outcomes, especially in inpatient settings. Kroppan et al. (11) described START implementation in two phases at Forensic Mental Services at Brøset in Trondheim, Norway, during a 10-year period. Their study showed increased interdisciplinary participation with the implementation of START. The research group also highlighted that the implementation of START requires continuous efforts. The application of the assessments to the treatment plans proved challenging when the study was performed, although progression from the assessment to the assessment-treatment phase during the implementation period was identified. In the current study, the START implementation was performed by clinicians who had experience using START in the clinical setting and experience training clinicians to use START. In each unit, two superusers were educated about START and were in charge of its implementation in their unit. They were supervised by the superusers of the pilot unit, who were supervised by teachers from Norway. The superusers met during the implementation phase to rate cases together. The intensive use of external supervision and continuous follow-up could explain the positive implementation process and significant study results.

To our knowledge, the study by Gunenc et al. (17) is the only one that focused on the benefits and outcomes of START in a forensic inpatient setting. They expected to find a reduction in adverse behaviors (physical and verbal aggression, self-harm, victimization, self-neglect, unauthorized leave, and substance abuse); however, they found no significant changes in physical or verbal aggression over time. There was no reduction in self-harm or substance abuse incidents during the 3 months after the START evaluation. Despite the power calculations, the authors (17) indicated that the sample size ($n = 50$) was one explanation for their results. During our study, we opted for a study period that was considerably longer than the 3-month comparison period before and after the assessment follow-up period used by Gunenc et al. (17). The longer study period might be one of the reasons for our significant results. We only included patients who demonstrated that they can use aggression to express themselves; therefore, patients were included if they had a BAE score >0.

According to the research literature within the field of forensic psychiatry and personal recovery processes, START is emphasized as an important risk assessment tool because it focuses on the resources, strengths, and protective factors in addition to the weaknesses and risks of the individual patients (42, 43). Managing risk as well as positive risk-taking and protective factors are key offender recovery elements in specialized forensic services, and this implies the involvement of mentally disordered offenders in their risk assessment and management and reduction of specific risks (44–46). Consequently, it would be relevant to develop a patient version of START to support and increase the involvement of the mentally disordered offenders, thereby supporting the processes of personal recovery. Lockertsen et al. (47) added items to the original version of the BVC and studied their extended version; for example, their Self-Report Risk Scale provided patients with an opportunity to predict their risk of violence. As a result, their study showed that expressing one's risk resulted in better short-term accuracy of predicting violence than the original BVC (45).

In a systematic review by Goulet et al. (48) its being concluded that with implementation of a program that focues on reducing seclusion and reduction it is possible to affected the use of such methodes in a positive way. The review defines such programs as programs including the following key-components; Leadership, training, post-seclusion and restraint review, patient involvement, use of prevention tools and forcus on the therapeutic environment. The use of START is one component in one of the mentioned six key-components, namely "Prevention tools". In our study the only implemented or used component that in daily practice separates the intervention group and the control group is the use of START.

A patient version of START would probably help to increase patient awareness of risk factors and highlight the responsibilities of the patients and the professionals working with them. As pointed out in the substantial literature about recovery processes in forensic settings, such approaches can help patients regain a sense of control over their lives, thereby providing hope (39). Furthermore, the implementation of START in specialized forensic outpatient services would be an interesting area for future research in the context of Denmark. Troquete et al. (49) examined the preventive effect of combining START and a shared care protocol in forensic outpatient settings without finding a significant preventive effect on recidivism to violent or criminal behavior. They (49) stated that the proportion of clients in the intervention group not receiving the intervention or receiving it only once was a limitation. Additionally, they did not have much success motivating the case managers to perform activities during their study, which was a limitation to their study (49). Therefore, this topic requires further scrutiny.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Written informed consent was not obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

JH, CD, and JB carried out the project. VS supervised the analysis. JH and JB took lead in writing the manuscript. All authors discussed the results and contributed to the final manuscript. All authors contributed to the article and approved the submitted version.

ACKNOWLEDGMENTS

The authors would like to acknowledge the staff at the Forensic Department of the Mental Health Center, Sct Hans, Copenhagen University Hospital – Mental Health Services CPH, Copenhagen, Denmark.

REFERENCES

1. Chu CM, Thomas SDM, Ogloff JRP, Daffern M. Short—the short—to medium-term predictive accuracy of static and dynamic risk assessment measures in a secure forensic hospital. *Assessment.* (2013) 20:230–41. doi: 10.1177/1073191111418298
2. Crocker AG, Garcia A, Israel M, Hindle Y, Gagnon D, Venegas C, et al. *Implementing and using a systematic risk assessment scheme to increase patient safety on a risk management unit for individuals with severe mental illness: A demonstration project*. Edmonton, AB: Canadian Patient Safety Institute (2008).
3. Daffern M. The predictive validity and practical utility of structured schemes were used to assess the risk for aggression in psychiatric inpatient settings. *Aggression Violent Behav.* (2007) 12:116–30. doi: 10.1016/j.avb.2006.03.005
4. Dickens, GL, O'Shea LE, Christensen M. Structured assessments for imminent aggression in mental health and correctional settings: systematic review and meta-analysis. Int J Nurs Stud. (2020) 104–104:103526. doi: 10.1016/j.ijnurstu.2020.103526
5. Hogan NR, Olver ME. Assessing risk for aggression in forensic psychiatric inpatients: An examination of five measures. *Law Hum Behav.* (2016) 40:233–43. doi: 10.1037/lhb0000179
6. Lewis AHO, Webster CD. General instruments for risk assessment. *Curr Opin Psychiatry.* (2004) 17:401–5. doi: 10.1097/01.yco.0000139978.68060.5a
7. Singh JP, Serper M, Reinharth J, Fazel S. Structured assessment of violence risk in schizophrenia and other psychiatric disorders: a systematic review of the validity, reliability, and item content of 10 available instruments. *Schizophr Bull.* (2011) 37:899–912. doi: 10.1093/schbul/sbr093
8. Webster CD, Douglas KS, Eaves D, Hart S. *HCR-20: Assessing the Risk of Violence*. Vancouver: Simon Fraser University Mental Health Law and Policy Institute (1997).
9. Webster C, Martin M, Brink J, Nicholls T, Desmarais S. *Manual for the Short-termTerm Assessment of Risk and Treatability (START). 1.1 Version*. Coquitlam: British Columbia Mental Health and Addiction Services (2009).
10. Cartwright JK, Desmarais SL, Hazel J, Griffith T, Azizian A. Predictive validity of HCR-20, START, and static-99R assessments in predicting institutional aggression among sexual offenders. *Law Hum Behav.* (2018) 42:13–25. doi: 10.1037/lhb0000263
11. Kroppan E, Nonstad K, Iversen RB, Søndenaa E. Implementation of the short-term assessment of risk and treatability over two phases. *J Multidiscip Healthc.* (2017) 10:321–6. doi: 10.2147/JMDH.S133514
12. Paetsch A, Van Os TWDP, Troquete NAC, Van Den Brink RHS. Single-item predictive validity of the short-term assessment of risk and treatability (START) for violent behavior in outpatient forensic psychiatry. *J Forensic Psychiatry Psychol.* (2019) 30:630–41. doi: 10.1080/14789949.2019.1581831
13. Troquete NA, van den Brink RH, Beintema H, Mulder T, van Os TW, Schoevers RA, et al. Predictive validity of the short-term assessment of risk and treatability for violent behavior in outpatient forensic psychiatric patients. *Psychol Assess.* (2015) 27:377–91. doi: 10.1037/a0038270
14. Whittington R, Bjørngaard JH, Brown A, Nathan R, Noblett S, Quinn B. Dynamic relationship between multiple START assessments and violent incidents over time: a prospective cohort study. *BMC Psychiatry.* (2014) 14:323. doi: 10.1186/s12888-014-0323-7
15. Abidin Z, Davoren M, Naughton L, Gibbons O, Nulty A, Kennedy HG. Susceptibility (risk and protective) factors for in-patient violence and self-harm: prospective study of structured professional judgment instruments START and SAPROF, DUNDRUM-3, and DUNDRUM-4 in forensic mental health services. *BMC Psychiatry.* (2013) 13:197. doi: 10.1186/1471-244X-13-197
16. Dickens GL, O'Shea LE. How short should a short-term risk assessment be? Determining the optimum interval for START reassessment in a secure mental health service. *J Psychiatr Ment Health Nurs.* (2015) 22:397–406. doi: 10.1111/jpm.12232
17. Gunenc C, O'Shea LE, Dickens GL. Structured risk assessment for reduction of multiple risk outcomes in a secure mental health setting: use of the START. *Crim Behav Ment Health.* (2018) 28:61–71. doi: 10.1002/cbm.2036
18. O'Shea LE, Dickens GL. Predictive validity of the START for unauthorised leave and substance abuse in a secure mental health setting: a pseudo-prospective cohort study. *Int J Nurs Stud.* (2015) 52:970–9. doi: 10.1016/j.ijnurstu.2015.02.007
19. O'Shea LE, Dickens GL. Short-term assessment of risk and treatability (START): systematic review and meta-analysis. *Psychol Assess.* (2014) 26:990–1002. doi: 10.1037/a0036794
20. Ramesh T, Igoumenou A, Montes MV, Fazel S. Use of risk assessment instruments to predict violence in forensic psychiatric hospitals: a systematic review and meta-analysis. *European psychiatry.* (2018) 52:47–53. doi: 10.1016/j.eurpsy.2018.02.007
21. Whittington R, Pollak C, Keski-Valkama A, Brown A, Haines-Delmont A, Bak J, et al. Unidimensionality of the strengths and vulnerabilities scales in the short-term assessment of risk and treatability (START). *Int J Forensic Ment Health.* (2021) 20:1–10. doi: 10.1080/14999013.2021.1953193
22. Danish Health Authority. *Anbefalinger for nedbringelse af tvang for mennesker med psykiske lidelser*. København: Sundhedsstyrelsen (2021).
23. Hemming K, Taljaard M, Grimshaw J. Introducing the new CONSORT extension for stepped-wedge cluster randomized trials. *Trials.* (2019) 20:68. doi: 10.1186/s13063-018-3116-3
24. Brown CA, Lilford RJ. The Stepped wedge trial design: a systematic review. *BMC Med Res Methodol.* (2006) 6:54. doi: 10.1186/1471-2288-6-54
25. Bowers L, Van Der Werf B, Vokkolainen A, Muir-Cochrane E, Allan T, Alexander J. International variation in containment measures for disturbed psychiatric inpatients: a comparative questionnaire survey. *Int J Nurs Stud.* (2007) 44:357–64. doi: 10.1016/j.ijnurstu.2006.01.005
26. Bekendtgørelse af lov om anvendelse af tvang i psykiatrien m.v. *Psykiatriloven Den Sundheds Ældreministeriet LBK* 936 af 02/09/2019. Available online at: https://www.retsinformation.dk/eli/lta/2019/936 (accessed February 9, 2022).
27. Nijman HL, Palmstierna T, Almvik R, Stolker JJ. Fifteen years of research with the staff observation aggression scale: a review. *Acta Psychiatr Scand.* (2005) 111:12–21. doi: 10.1111/j.1600-0447.2004.00417.x
28. Nijman HLI, Muris P, Merckelbach HLGJ, Palmstierna T, Wistedt B, Vos AM, et al. The staff observation aggression scale-revised (SOAS-R). *Aggr Behav.* (1999) 25:197–209. doi: 10.1002/(SICI)1098-2337(1999)25:3<197::AID-AB4>3.0.CO;2-C

29. Palmstierna T, Wistedt B. Staff observation aggression scale, SOAS: Presentation and evaluation. *Acta Psychiatr Scand.* (1987) 76:657–63. doi: 10.1111/j.1600-0447.1987.tb02936.x
30. Almvik R, Woods P. The brøset violence checklist (BVC) and prediction of inpatient violence: preliminary results. *Psychiatr Care.* (1998) 5:208–13.
31. Almvik R, Woods P, Rasmussen K. The brøset violence checklist: sensitivity, specificity, and interrater reliability. *J Interpers Violence.* (2000) 15:1284–96. doi: 10.1177/088626000015012003
32. Hvidhjelm J, Sestoft D, Bjørner JB. The Aggression observation short form identified episodes not reported on the staff observation aggression scale-revised. *Issues Ment Health Nurs.* (2014) 35:464–9. doi: 10.3109/01612840.2013.879359
33. Thomsen C, Starkopf L, Hastrup LH, Andersen PK, Nordentoft M, Benros ME. Risk factors of coercion among psychiatric inpatients: A nationwide register-based cohort study. *Soc Psychiatry Psychiatr Epidemiol.* (2017) 52:979–87. doi: 10.1007/s00127-017-1363-3
34. Andersen K, Nielsen B. Coercion in psychiatry: the importance of extramural factors. *Nord J Psychiatry.* (2016) 70:606–10. doi: 10.1080/08039488.2016.1190401
35. Hooper R, Copas A. Stepped wedge trials with continuous recruitment require new ways of thinking. *J Clin Epidemiol.* (2019) 116:161–6. doi: 10.1016/j.jclinepi.2019.05.037
36. Corportation I, IBM. *SPSS Statistics for Windows (version 25.0, Armonk, NY, USA)*. Armonk, NY: IBM Corp (2017).
37. Northern Nurse F. Ethical guidelines for nursing research in the Nordic Countries. *Vard Nord.* (2003) 23:1–19.
38. De L'Europe C. *"White Paper" on the Protection of the Human Rights and Dignity of People Suffering From Mental Disorder, Especially Those Placed as Involuntary Patients in a Psychiatric Establishment*. Srasbourg: Council of Europe (2000).
39. Zhan Z, Van Den Heuvel ER, Doornbos PM, Burger H, Verberne CJ, Wiggers T, et al. Strengths and weaknesses of a stepped wedge cluster randomized design: Its application in a colorectal cancer follow-up study. *J Clin Epidemiol.* (2014) 67:454–61. doi: 10.1016/j.jclinepi.2013.10.018 (accessed February 9, 2022).
40. Beard E, Lewis JJ, Copas A, Davey C, Osrin D, Baio G, et al. Stepped wedge randomised controlled trials: Systematic review of studies published between 2010 and 2014. *Trials.* (2015) 16:353. doi: 10.1186/s13063-015-0839-2
41. Hemming K, Haines TP, Chilton PJ, Girling AJ, Lilford RJ. The stepped wedge cluster randomised trial: rationale, design, analysis, and reporting. *BMJ.* (2015) 350:h391. doi: 10.1136/bmj.h391
42. Drennan G, Wooldridge J, Aiyegbusi A, Alred D, Ayres J, Barker R, et al. *Making Recovery a Reality in Forensic Settings, ImROC Briefing Paper 10*. London: Centre for Mental Health Mental Health Network/NHS Confederation (2014).
43. Simpson AIF, Penney SR. Recovery and forensic care: recent advances and future directions. *Crim Behav Ment Health.* (2018) 28:383–389. doi: 10.1002/cbm.2090
44. Hillbrand M, Young JL, Griffith EE. Managing risk and recovery: redefining the miscibility of oil and water. *J Am Acad Psychiatry Law.* (2010) 38:452–456. doi: 10.1002/clen.201000044
45. Drennan G, Alred D. Secure recovery: approaches to recovery in forensic mental healthmental health settings. *Routledge.* (2012). 23–40. doi: 10.4324/9780203129173
46. Møllerhøj J. Offender recovery. forensic patient perspectives on long-term personal recovery processes. *Int J Environ Res Public Health.* (2021) 18:6260. doi: 10.3390/ijerph18126260
47. Lockertsen Ø, Varvin S, Færden A, Eriksen BMS, Roaldset JO, Procter NG, et al. Risk assessment of imminent violence in acute psychiatry: a step towards an extended model. *J Forensic Psychiatry Psychol.* (2020) 31:41–63. doi: 10.1080/14789949.2019.1663898
48. Goulet M-H, Larue C, Dumais A. Evaluation of seclusion and restraint reduction programs in mental health: a systematic review. *Aggress Violent Behav.* (2017) 34:139–46. doi: 10.1016/j.avb.2017.01.019
49. Troquete NA, Van Den Brink RH, Beintema H, Mulder T, van Os TW, Schoevers RA, Wiersma D. Risk assessment and shared care planning in out-patient forensic psychiatry: Cluster randomized controlled trial. *Br J Psychiatry.* (2013) 202:365–371. doi: 10.1192/bjp.bp.112.113043

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers | Frontiers in Psychiatry

REVIEW
published: 30 May 2022
doi: 10.3389/fpsyt.2022.894520

Space and Well-Being in High Security Environments

Thomas Ross[1†], Jan Bulla[1] and María Isabel Fontao[2†]*

[1] Forensic Psychiatry and Psychotherapy, Reichenau Psychiatric Center, Reichenau, Germany, [2] Department of Psychology, University of Konstanz, Konstanz, Germany

Research into the spatial dimensions of deprivation of liberty and psychiatric hospitalization has a long and complex tradition. In this context, the increasing numbers of prisoners and patients in forensic hospitals have impressively shown how difficult it is to ensure security, therapy and rehabilitation when space is scarce or not well-suited. In this narrative review, we present the main findings of recent lines of research on spaces in prisons and forensic psychiatric wards, with particular attention to the links between overcrowding in prisons and secure forensic psychiatric hospitals and violence, the foundations of prison and hospital architecture, and on how the design of spaces in prisons and hospitals can influence well-being. We assess and discuss these findings in the context of the current debate on how well-being in secure spaces can support the achievement of rehabilitation goals even in overcrowded institutions.

Keywords: forensic mental health, prison, therapeutic architecture, therapeutic design, narrative synthesis

OPEN ACCESS

Edited by:
Najat R. Khalifa, Queen's University, Canada

Reviewed by:
Artemis Igoumenou, University College London, United Kingdom
Mary Lavelle, Queen's University Belfast, United Kingdom

***Correspondence:**
Thomas Ross
thomas.ross@uni-konstanz.de

†These authors have contributed equally to this work

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: *11 March 2022*
Accepted: *10 May 2022*
Published: *30 May 2022*

Citation:
Ross T, Bulla J and Fontao MI (2022) Space and Well-Being in High Security Environments. Front. Psychiatry 13:894520. doi: 10.3389/fpsyt.2022.894520

INTRODUCTION: INTERNATIONAL TRENDS ON FORENSIC MENTAL HEALTH SERVICES IN WESTERN COUNTRIES

In Europe, there has been a well-documented trend toward increased placement of psychiatric patients who have offended in forensic psychiatric institutions for several decades. This trend has been noted in several Western European countries, and it continues to the present day. There is also evidence of a similar trend outside Europe, e.g., in Canada and the United States. Jansman-Hart et al. (1) reported these developments in an analysis of a number of European countries as well as Canada and the United States, albeit to different degrees. In Canada, the number of new defendants entering the system doubled annually from 1992 to 2004. In the United States, a related development called the "forensification" of state hospitals was reported. Between 1999 and 2014, responses to a nationwide survey on the number of forensic patients in state psychiatric hospitals showed a 76% increase in the number of forensic patients nationwide. The largest increase was in people who were court-ordered after being found incompetent to stand trial and requiring inpatient recovery services (2). Several countries in Western Europe (Austria, Denmark, England, Germany, Ireland, Italy, Netherlands, Spain and Switzerland) reported an increase in the number of forensic beds by an average of 110% between 1990 and 2006 (1). (3, 4) reported on nine European countries with regard to their use of forensic psychiatric services and described for 1990, 2002 and 2006 a clear increasing trend in all these countries. Around the same time as this work, Salize and Dressing (5) studied the admission of mentally disordered offenders to specialized forensic care in fifteen states of the European Union. These results all point in the same direction, and it can be assumed that this trend has continued over the past and current decade in many European countries, although not all [e.g., Czechia (6), or Finland (7)]. For England, however, increasing occupancy has been safely

documented up to 2016 (8), with Keown et al. (9) linking the development of general psychiatric beds to transfers from prison to forensic psychiatric hospitals. The closure of mental health beds was accompanied by an increase in referrals from prison to hospital for treatment (civil or forensic involuntary detentions). Convincing evidence of long-term significant increases in placements in forensic psychiatric facilities is also available from Germany (10–13).

The physical environment has been described as one of the central determinants of mental health and well-being (14), and the importance of a comprehensive understanding of the concepts of space and place for mental health and care has been stressed by researchers of different disciplines (15). Due to the coercive nature of secure forensic environments and the space restrictions they impose on residents, an increased potential impact of the physical environment on their well-being can be assumed. In a report from 2012, the United States Government Accountability Office stated that overcrowding "affects inmates' daily living conditions, participation in programs, meaningful work opportunities, and visitation," including "congregating inmates at higher risk of violence and more potential victims for longer periods of time," "inmate waiting lists [for programs] and idleness," the inability to "meet inmates' substance abuse or educational needs," "fewer opportunities to do meaningful work," "crowded visiting rooms [that] make it difficult for inmates to visit their families," and increased "staff stress and overtime" and "fewer correctional staff on board than needed" [(16), pp. 18–23]. It also explicitly warned that prison overcrowding could increase the risk of violence, especially in high-security facilities that house the most dangerous prisoners, and compromise the achievement of rehabilitation aims.

Previous review studies on similar topics reported findings on architecture and design in prison services (17) and described clinical, legal and structural aspects of forensic hospital design (18). In this paper, we add on the scope of previous work: First, we provide an overview of research on the effects of overcrowding in custodial institutions and hospitals. In the next section, theoretical models and selected findings on the relationships between physical environment and well-being in non-forensic settings are presented. We then move on to specific results of research in high security environments which add to the general findings on space in therapeutic spaces and design. Finally, we discuss the possibility of applying these notions to enhance well-being in stressed secure forensic spaces.

The relevance of the topic arises in view of rising numbers of prisoners and patients in forensic hospitals (and related phenomena, e.g., compulsory psychiatric admissions), which can lead to overcrowding in custodial institutions and require facility extensions or new buildings. There is a wide variation in the provision of secure forensic mental healthcare across international jurisdictions; in this paper, the term "high security environments" refers to forensic facilities of different levels of security (e.g., low, medium, high) and includes both custodial and hospital environments. The notion of "well-being" includes biological, psychological, and social dimensions (19). Generally, we focus on well-being as it relates to a (sense of) safety and to the absence of clinical psychopathology resp. of stressors (e.g., violence and aggression, self-harm and suicide) which negatively affect mental health.

METHODS

A literature search was carried out between January and February 2022 in the databases PsycInfo, PSYNDEX, and Google Scholar. The search terms were: overcrowding (or) crowding (or) overcrowded (or) density (or) bed occupan*; architecture (or) architectural design (or) building design; prison (or) jail or incarceration (or) imprisonment (or) correction facilities; forensic psychiatry (or) forensic mental health (or) secure unit (or) forensic care. A preliminary selection was made by two authors independently. Second, the reference lists of the publications that emerged in the preliminary selection were searched for potentially relevant literature. The final selection was made by two authors according to the relevance for the main topics of the narrative review. The included publications were published in English language in a scientific journal between 2000 and 2022; one book chapter and one doctoral dissertation were also included. Because of the scope of the review, which also covers theoretical models and interdisciplinary approaches, different types of publications were included: original research, review papers, and papers with a focus on theory or methods.

RESULTS

The majority of the 31 included publications come from English speaking countries (United States: 7: United Kingdom: 7; Australia: 5; Canada: 1); four publications come from Sweden, one from Finland, two from Switzerland, one from Germany, and one from Turkey. There were 16 original studies, ten reviews and five publications with a focus on theories/methods. Thirteen publications investigated the prison setting including one pre-trial detention center), six publications focused on forensic hospitals; in-patient psychiatric wards, mental health facilities, and therapy rooms were also investigated (view **Supplementary Tables 1–3**).

Hospital Overcrowding

Overcrowding in hospitals often leads to safety concerns among mental health professionals and hospital managers. The greatest risk is seen in an increase in aggressive and violent attacks by patients on fellow patients and staff. The evidence for a significant association between overcrowding and aggressive patient behavior is mixed and often limited to small studies. Virtanen et al. (20) investigated the association between ward overcrowding and violent physical assaults in inpatient psychiatric acute hospital wards in Finland. Staff members (n = 1098) were asked to report the timing of physical assaults on themselves and on ward property. Almost half of the hospital staff worked in overcrowded wards, and an overcrowding rate of more than 10 per cent units at the time of the event was associated with violent assaults on staff [odds ratio (OR) = 1.72, 95% CI 1.05–2.80; OR = 3.04, 95% CI 1.51–6.13

in adult wards], after adjustment for confounding factors [age and gender; type of occupation (physician/head nurse/registered nurse/licensed practical psychiatric nurse), type and length of job contract, hospital district and specialty, sum of patient days per month]. No association was found with attacks on ward property (OR = 1.06, 95% CI 0.75–1.50). The study has been criticized in light of methodological issues related to criteria of causation, which may not all have been fulfilled before a causal relationship between higher occupancy rates and violence can be established. Kapoor (21) argued that in addition to the reported dose-response relationship, uncontrolled staffing variables and ward acuity levels could also be associated with the occurrence of aggression. Despite this criticism, the Virtanen, Vahtera et al. study is still considered important evidence of an association between overcrowding and assaults against staff on psychiatric wards. Weltens et al. (22) presented an extensive systematic literature review on the risk factors for aggression and violent assaults on (general) psychiatric wards. The explanatory factors for aggressive behavior were divided into patient, staff and ward factors. Significant risk factors on the wards were higher bed occupancy, busy places on the ward, walking rounds, unsafe environment, restrictive environment, lack of daily structure, smoking and lack of privacy. Most of the studies included in this literature review indicated a substantial positive association between overcrowding and aggression, but one study found no correlation between the number of patients in the ward and aggressive incidents. Referring to this, in the subsection on bed occupancy, the authors state that "the evidence for overcrowding as a factor contributing to the occurrence of aggression is contradictory, but there is some evidence that overcrowding is associated with the occurrence of aggression" [(22), p. 16].

Prison Overcrowding

Prison overcrowding has long been defined in the literature as a safety or health problem. As early as the late 1970s, the occupancy rate in United States prisons began to rise sharply. In the 30 years from 1975 to 2005, the number of people in prison increased sevenfold. The United States imprisons far more people per 100,000 resident population than any other country in the world for which relevant data is available. For the years 2003 and 2004, the number of incarcerated persons was 726 persons per 100,000 inhabitants; by comparison, Canada had 116, Italy 98, Germany 96, France 91, Sweden and Switzerland 81 during the same period [(23), pp. 416–17].

In view of the development in the United States, the problem of overcrowding and its potential impact on safety and health became the focus of scientific research in other countries as well. There is hardly anyone who does not see overcrowding in prisons as a problem. Massive overcrowding, such as that which existed in the southern states of the United States, places a considerable burden on prisoners, but also on correctional officers, who face very high levels of stress and threat (24). Baggio et al. (25) investigated the relationship between prison violence and institutional factors in a Swiss remand prison between 2013 and 2018, measuring violence (assaults requiring immediate medical treatment) as well as annual overcrowding and turnover rates. The results showed that prison violence was higher when overcrowding and turnover increased. In a large study on prison structure, inmate mortality and suicide risk in Europe by Rabe (26), the author found an increased risk of suicide for sex offenders, violent offenders and prisoners sentenced to short and long-term imprisonment. In addition, prison mortality was associated with overcrowding.

However, the correlations are not always as clear-cut as they may seem based on these studies. In fact, there is mixed evidence on the relationship between prison violence and institutional factors such as overcrowding and turnover, and recent research suggests that these factors may not be important or relevant. For a prison population in Switzerland, Wolff et al. (27) showed that overcrowding of more than 200 per cent was associated with self-strangulation or hanging, but not with all self-harm cases. A meta-analysis by Franklin et al. (28) showed that overcrowding in prisons is often not always associated with aggressive assaults or security-related restraints. Looking at their findings, the authors summarized that prison overcrowding has little substantive impact on inmate misbehavior. However, the evidence for the negative effects of prison overcrowding in general is overwhelming. Walker et al. (29) conducted a systematic literature review on changes in prisoners' mental health and examined how these relate to various aspects of incarceration and the prison environment, including overcrowding. From fifteen longitudinal studies included in the review, the authors concluded that isolation, overcrowding and larger prisons are associated with poorer mental health in prisoners, which is likely to place a particular burden on prison staff and mental health services in addition to the problems experienced by prisoners.

Similar caution must be exercised in assessing the suicide risk of incarcerated persons. In general, the suicide risk of prisoners is significantly higher than that of the general population in many countries [(30), figure 1, p. 950]. However, a whole range of factors play a role here, so that the higher risk cannot be unequivocally attributed to overcrowding. van Ginneken et al. (31) conducted a study on suicide rates as a function of occupancy rates based on data from the Ministry of Justice for adult prisons in England and Wales (2000–2014). Larger population size, higher prison turnover, higher security and public management were associated with higher suicide rates. However, when controlling for these factors, overcrowding was not related to suicide rates. Fazel et al. (30) studied 3,900 prison suicides from 24 countries between 2011 and 2014 and tested associations between suicide rates and 11 factors related to prisons and health services, including overcrowding. Again, there was no significant relationship of overcrowding with suicide risk.

In sum, empirical evidence to date is not conclusive about the effects of overcrowding in prison on violence against others or self-harm. On the other hand, the continuous efforts of researchers to study these effects may reflect the perception of prison administrations and stakeholders that overcrowding is a pervasive phenomenon that can affect the foundations (i.e., security) and rehabilitation goals of the prison system.

Therapeutic Architecture and Design: Models and Findings in Non-forensic Settings

There is no doubt that the physical environment affects building users, and there has been considerable debate about the relevant subtopics and the most suitable methodologies, e.g., interdisciplinary research, evidence-based design, or occupants' feedback/users' needs (32). Post-occupancy evaluations (POE) is a diagnostic and research tool that includes "the process of examining and evaluating the functioning of a building in a systematic way after completion" [(33), p. 58]. Typically, the researchers gather feedback from users in form of social and behavioral data and seek to establish a link between building design and use behaviors. This approach generated a considerable amount of knowledge in the field. However, criticism was raised: over the long term, the emphasis on measuring users' satisfaction could be less effective for building design. Instead, a shift to evidence-based design was called for. Similar to evidence-based medicine, this approach assumes that the results of research (POE or other feedback studies, field research in sites or buildings, laboratory research) are necessary to make good design and building decisions possible (34).

An optimal treatment environment for mentally ill people places special demands on the architecture and furnishing of buildings and interior spaces (35). The term "healthcare architecture" is often used in this context, and significant progress has been made in this field in many western industrialized countries in recent decades. Deinstitutionalization and community-based treatments are some of the main attempts that have been made to create a more "normal environment" for those affected.

The "Normalization Theory" was introduced into mental health care from the adjoining field of learning disabilities (36). It states that institutions for mentally ill people should have as many references as possible to a normalized interior design in order to mitigate institutionalization and support reintegration and rehabilitation for patients in closed institutions (17). However, it is clear that psychiatric care cannot be completely deinstitutionalized anywhere. In addition to a living environment that should be kept as close to everyday living as possible, larger inpatient facilities require a therapeutic environment with appropriate spaces which support the therapeutic work. Because this cannot be achieved with the architecture of the family home, Chrysikou (37) called for a "Fit for Purpose" architecture for the mentally ill and proposed a theoretical model on the basis of a modern therapeutic architecture which can be implemented. The empirically based SCP model was developed according to three parameters that define mental illness: safety and security, competence, and personalization and choice, and it takes into account the main requirements or needs of mental health care. Regarding the first parameter, safety and security, risks include harm and self-harm, violence and abuse, vulnerability, substance abuse, self-neglect and noise. Competence refers to the ability of clients to maintain a certain level of independence to take care of themselves both physically and socially, with the ability to live independently being the optimum. Personalization and freedom of choice, the third parameter, refers to the degree of freedom the client can achieve in a facility (37). A recent rapid review by Oostermeijer et al. (38) found preliminary evidence that the use of good design and architecture principles can help to prevent measures of seclusion and restraint in psychiatric facilities. The importance of the physical environment in psychiatric settings has also been considered in a safety model of psychiatric care, e.g., the Safewards model (39). This model aims to reduce risk and coercion on inpatient wards and postulates six areas that influence conflict and containment rates: the patient community, patient characteristics, the legal framework, the staff team, the physical environment and the environment outside the hospital. The physical environment includes, among other things, the quality and complexity of the buildings, with high quality and comfort eliciting greater care and respectful interaction with patients, as well as the presence of isolation rooms and locked doors or psychiatric intensive care units. In turn, staff interact with the physical environment by, for example, ensuring that the building is well maintained or adapting it to patients' preferences. According to a recent study, the Safewards model has shown a positive overall impact on the frequency of conflicts and the containment of problems in psychiatric units (40). However, it was not reported whether there was a specific effect of the physical environment.

In a comprehensive review on mental health and architecture, Connellan et al. (32) identified 13 (partially overlapping) topics on the effects of the architectural designs of mental health facilities on the users, including security/privacy, light, gardens, impact of architecture on mental health outcomes, interior design, psychogeriatric, and forensic psychiatric facilities. The authors concluded that there is a shortage of space and a lack of privacy in wards. Moreover, violence against patients and staff is widely prevalent and increasing. They emphasized the importance of providing demarcated spaces for particular activities and, in general, more space.

Therapy Rooms and Outdoor Therapy

The characteristics of spaces in which therapies are conducted could improve the psychotherapeutic process and patient well-being. Sinclair (41) explored the views and experiences of 24 clients and 21 therapists on the physical environment of the therapy room for counseling and psychotherapy. Comfortable seating and a comfortable room temperature, soundproofing, no interruptions and accessibility of the room were ranked as most important by clients and therapists. Participants reported that feeling physically comfortable and safe in a room enabled greater engagement in the therapeutic process. Rooms with a "clinical" appearance were described as not helpful. Three main themes emerged from the responses: Comfort, the appearance of the room and the room as a workspace. It is likely that these themes can also be applied to institutionalized contexts where psychotherapy takes place [see also (42), for a similar small-scale study]. Waiting rooms may affect mental states (emotions, expectations, memories, etc.) prior to the therapeutic session, and the application of principles of therapeutic design can increase the benefits of the therapeutic intervention (43).

A larger study by Backhaus (44) also investigated clients' and therapists' perceptions of the importance of the physical environment of the therapy room. Specifically, Backhaus wanted to find out what importance clients and therapists attached to accessories, colors, room design, furniture, lighting, temperature, and sounds. In addition, the study examined the connection between client loyalty and the physical environment of the therapy room. The sample consisted of 226 participants (73 therapists and 153 clients). The physical environment had a significant impact on the ability of clients and therapists to establish a therapeutic relationship. Accessories and colors were rated as least important, while sound was rated as the most important attribute of the therapy room. In addition, room design was rated as more important than furniture and lighting. Therapists rated lighting as more important than accessories and furnishings, and clients rated furnishings as more important than lighting and accessories. The results also showed that lighting was significantly correlated with clients' perceived competence and trustworthiness of the therapist. Although the research topic of architecture and design in therapeutic rooms has received increased attention in the last decades, it is unclear to what extent clinical practitioners are aware of these relevant findings and recommendations (43).

Talking therapies in the outdoors can also have physiological and psychological benefits, such as reduced stress responses and improved mood for both patients and therapists. With the aim of providing a framework for best practice, Cooley et al. (45) published a review of the outdoor experiences of therapists and their clients (38 articles published between 1994 and 2019 containing data from 322 therapists and 163 clients). The outdoor context for therapy ranged from sitting or walking in urban parks and forests to remote expeditions into the wilderness. The bottom line was that patient and therapist well-being improved with positive effects on relationship building and stabilization.

Architecture and Design in High Security Environments

Prisons

The architecture and design of buildings and living and therapy spaces in specially screened settings must now meet a number of conditions in order to achieve modern standards. Particularly in the United States and in other western countries where prisons are overcrowded, the design or redesign of prisons is seen as a way of legitimizing the execution of sentences by making these as humane as possible, so that prisoners and staff experience justice as fair or balanced. According to St John (46), the core idea of "placial justice" is that social justice can be improved through open, transparent and inclusive (OTI) design in prison buildings. Assuming that this approach can strengthen the penal legitimacy and rehabilitative function of the prison system, the author posits that the principles of OTI design should be taken into account especially in the planning of new buildings or extensions of prisons. Grant and Jewkes (47) outlined the history of prisons in the United States and Australia and argued that for a long time Australia uncritically imitated the penitentiary concepts of the United States. According to the authors, this led to prison design and policies that were not well-suited to the local conditions, resulting in hard-to-manage prisons, poor staff morale and a significant number of non-violent and violent incidents related to poorly designed environments. The 21st. century saw the emergence of genuine Australian approaches to prison design that better addressed the needs of particular groups of prisoners. A number of prisons have been built to provide therapeutic, drug-free and treatment environments for HIV-positive and mentally disabled prisoners, for prisoners with substance abuse problems, women, sex offenders or special facilities for Aboriginal people [(47), p. 238]. They concluded that "(t)he prevailing trend is away from traditional cell design toward cottage-style communities, i.e., accommodation units laid out on a campus," and progressive design can be paired with secure cell technology [(47), p. 239].

In 2018, the Research and Evaluation Unit of the Swedish Prison and Probation Service (SPPS) conducted a rapid review on behalf of the Real State of the SPPS. The aim of the review was to embed research findings on good architecture and design in policy discussions about large-scale, long-term investment decisions. The review summarizes the academic research on the role of physical environment in prison services. The authors included nine previous reviews on the significance of architecture and design in institutional settings and extended the findings with recent literature (18 journal articles, nine book chapters, and one monograph). The main findings were that a normalized or homely environment and reduced overcrowding (by international standards) contribute to higher levels of well-being for both inmates and staff. Room layout is beneficial as it provides a clear overview and offers natural opportunities for staff and inmates to meet. From the previous reviews, the authors deduced that natural light or lighting similar to daylight, as well as access to nature, can reduce stress and increase well-being. In addition, prisoners may be more affected than other groups by poor physical environments such as overcrowding, noise and inadequate ventilation. Focusing on the Swedish prison system, the authors noted that more could also be done to build centralized knowledge about the current state of Swedish prison facilities from a rehabilitative architecture and design perspective within the agency. They also saw room for improvement in the implementation of supportive environments, as well as in the application of best practices in new facility expansion [(17), p. 5].

Until a few years ago, there was little research on the factors that influence staff-prisoner relationships, and prison building design was not considered either. However, relationships between correctional officers and prisoners are crucial to prison life and affect prison order and the well-being of prisoners and staff. Beijersbergen et al. (48) investigated the relationship between prison architecture and prisoners' perceived relationship with officers using data from a large Dutch prison project with over 1,700 prisoners in 32 Dutch pre-trial detention centers. Prison design was related to the relationship between officers and prisoners. Prisoners in panopticon prisons in particular were less positive about officer-prisoner interactions than prisoners in other facilities. Older units and units with many double cells also had a detrimental effect on officer-prisoner relations. Morris and Worrall (49) examined the relationship between two types of prison architecture (telephone pole design and

campus design) and misconduct of male prisoners in Texas. The data was collected from 2,500 inmates, and inmate-level and prison-level predictors were included in the multilevel analyses. The results suggest that prison architecture was associated with non-violent misconduct (being assigned to a campus-style unit increased the odds of a property infraction, and of a security-related infraction), but not with inmate violence, drug-related misconduct, or reported possession of contraband. As for the limitations of the Morris and Worrall study, the authors acknowledged the use of a simplistic measure of prison architecture (aerial photographs), suggesting that measuring the characteristics of prison architecture requires more complex methods.

Satisfaction with the physical work environment can have positive effects on work efficiency and job commitment, and reduce staff turnover. Conversely, harsh work environment conditions in prison (intrusive noise, clutter, shabbiness) were related to decreased well-being, measured as somatic and psychological symptomatology, increased use of alcohol and tobacco, and sick leave rates (17).

Forensic Hospitals

The review of Connellan et al. (32) identified two research papers on the effects of physical environments in forensic hospitals. The central topics were architectural design, safety, privacy, and escapes. Similarities between those papers included a comfortable domestic scale and ambience, security, a pleasant, domestic atmosphere that is well-lit by natural light, and ample space for the patients. These topics were also focused on in later studies, adding on the findings on prison architecture and design presented above.

Three recent studies from Sweden were aimed at evaluating the effects of the relocation in new purpose-built, evidence-based forensic psychiatric facilities by collecting patient and staff feedback in three different forensic hospitals. Olausson et al. (50) investigated the patients' experiences of place and space using a qualitative design and thematic content analysis. Four themes emerged from the data: a private place, maintaining self-esteem, feeling comfortable and harmonious, and relating to one's life. From this, the authors concluded that purpose-designed environments can support daily life and well-being and create comfort, which is seen as very therapeutic by patients. Wijk H, et. al. (51) focused on patients' assessments of the atmosphere on the wards and the quality of care. Baseline data were collected in the old facilities and at three follow-up visits after the move over 3 years. Only seven of the 74 patients initially approached for participation were still present at the third follow-up, but these patients indicated that the quality of care had improved with the move to a new building. These methodological shortcomings illustrate the difficulties of conducting prospective longitudinal research in forensic hospitals, which is crucial to shed light on the long-term effects of the physical environment. The related study by Degl'Innocenti et al. (52) examined staff job satisfaction and perceptions of a person-centered physical and psychosocial environment following a move to a new setting. The results suggest that staff perceptions of ward atmosphere in forensic psychiatric hospitals depend on physical and psychosocial environment factors. Perceived ward atmosphere was assessed by using an instrument to evaluate the extent to which staff felt they were able to provide perception-centered care and the extent to which environmental factors supported them in their work. The move to the new, evidence-based facilities had a positive impact on staff perceptions of the ward atmosphere. Their perception of a person-centered physical and psychosocial environment increased after the move. In particular, they described a greater sense of security and "feeling at home" [(52), p. 28], as well as a greater ability to interact socially in the new work environment.

Eggert et al. (53) investigated related questions with a quasi-experimental study design. They examined the person-environment interaction effects of environmental design on ward climate, safety, job satisfaction and treatment outcomes in a new, high-security forensic psychiatric facility in Colorado. Participants included 879 individuals (n = 353 staff and n = 526 patients in three security groups) who were interviewed over three data collection periods: 6 months before moving to the new building, 6 months after moving to the new building, and 12 months after moving to the new building (combined experimental group). Staff and patients of the control group (n = 378) remained in their previous facilities. No significant differences were found in patient-to-patient and patient-to-staff assaults across the different time periods. For staff, no significant effects were found for any of the three factors of the Copenhagen Burnout Inventory (CBI). Ward climate, operationalized by therapeutic hold, patients' cohesion and mutual support, and experienced safety (measured with the EssenCES) were not significantly related to personal burnout, work-related burnout and client-related burnout. In sum, the effects of the new environmental design were less than expected and the authors conclude that "for in-patient forensic psychiatric treatment, the facility itself is a tool that requires interpersonal and organizational effectiveness to maximize its potential" (p. 537).

Not only atmospheric impressions are related to environmental variables. The physical environment is purported to influence aggression (see above), and also the use of coercive measures. Van der Schaaf et al. (54) investigated the design features of 199 psychiatric and forensic wards and their relationships with the use of coercive measures on over 23,000 admissions of around 15,000 patients. The 115 design-related variables covered features associated with the quality and the safety of the physical environment and the well-being of patients (privacy; daylight, views and nature; comfort and control; facility level; safety; rooms for seclusion). The authors found 14 design features that significantly affected the risk of being secluded during admission: the presence of an outdoor area, special security measures such as the presence of locking devices on doors with delayed alarm and opening, door position monitoring and a large number of patients in the building increased the risk of being secluded. Protective design features reducing the risk of being secluded were related to the privacy and autonomy of patients and included more private space per patient, a higher level of comfort and better visibility on the ward. The finding of the presence of an outdoor space or garden as a risk of being secluded, which is not consistent with prior studies, can be explained by the use of limited measures. Visibility on the

ward can negatively affect the ward atmosphere, but it can also increase the sense of security for patients and staff. These results underscore the complexity of measuring the characteristics of the physical environment as they relate to each other and their subjective impact on users.

Based on a review of the literature on features that make forensic psychiatric facilities best suited to the needs of forensic patients and staff, Seppänen et al. (18) proposed a systematic approach to the complex challenges of designing modern forensic hospitals. Key design issues that need to be addressed include carefully defining the patients to be cared for in the facility, defining the role and profile of the facility in the overall organization of forensic services, and weighing options based on current (pre-existing) facilities: Can the existing facilities be renovated/improved? If not, what are the arguments for the location (urban or rural facilities?). When building new facilities, a number of policy aspects need to be considered (regional, national, financial), and in terms of functional content, therapeutic and safety requirements should be carefully combined to meet the needs of patients and staff. Under the heading "Growth and Change," the authors listed some of the aspects that need to be considered to ensure that the design is long-lasting and does not become obsolete too quickly [(18), pp. 7–9]. For therapeutic non-forensic settings, theoretical models for contemporary architecture and design have been proposed. These build on the principles of Normalization Theory, but go beyond it by putting emphasis on three key therapeutic factors: safety, competence, and personalization (37). The question arises on as to what extent these models can be applied in high security contexts. Personalization and freedom of choice are still limited in institutions, especially in forensic psychiatric units. Staffing and training, stigma, resources and design can influence the client's interaction with the facility. Privacy and territoriality, as well as clients' opportunities to interact with other clients, staff or even people from the community inside or outside the facility, are features of personalization and freedom of choice. With the elements outlined above, this model can be easily transferred to environments where individuals who have committed crimes are to be resocialized and/or treated, i.e., prisons and forensic psychiatric institutions.

But here, too, the correlations between staffing, space availability, increased comfort and facilities, and exterior views of the environment cannot always be reproduced. In a multicentric study with cross-sectional design, Rogerson et al. (55) examined the relationship between the physical design of mental health facilities and the incidence of aggressive behavior in a nationwide study in the United Kingdom that included 101 forensic and non-forensic inpatient wards in seven NHS trusts. The physical environment/architecture of the wards and their general characteristics were assessed by means of the Ward Features Checklist (WFC). A higher score on the WFC dimension 1 "Staffing and space" represented "fewer beds; higher staff to service user ratios on day and night shifts; more dayroom and bedroom space per service user; and more toilets per service user"; a higher score on the WFC dimension 2 "Comfort and facility" included "higher indoor temperature; lower noise levels; fewer rooms open to service users in the day; the opportunity to participate in games with other service users; access to occupational therapy; type of flooring; and ward currently below service user capacity" (p. 3). Clinical ward staff in the participating wards (n = 191, estimated 10.3% response rate) completed an online survey focusing on subjective perceptions of safety in the workplace. For the measurement of the outcome variable (incidents of verbal and physical aggression, and property damage), official records for incidents in the prior 6 months were used. Physical aggression was associated with greater staffing and space (dimension 1 of the WFC; incident ratio = 2.19), as well as greater comfort and better facilities and outdoor views of the urban environment (dimension 2 of the WFC: Incident ratio = 1.24). For the verbal aggression and property damage incidents similar results were found as for physical aggression. These findings are not in line with the literature reporting an association of high bed occupation with aggression and coercive measures, but add to research pointing at a link between staffing and incidents (56). The authors acknowledge that there may be "complex organizational and relational factors that need further research to fully understand the overall context" (p. 1). In this sample, forensic wards reported lower levels of physical and verbal aggression compared to acute (non-forensic) wards. These findings open an array of possible interpretations (e.g., reporting culture in wards, attribution to resources according to perceived risks) which are worth investigating.

DISCUSSION

Limitations and Strengths

This review is narrative and not strictly systematic. There may have been small-scale international publications in other languages than English that have not been covered in this review. The results are not necessarily generalizable to all countries and settings owing to wide variations in the provision of forensic mental health and custodial care across international jurisdictions. A major strength is the comprehensive character of this review, which outlines the findings on negative effects of overcrowding in both hospitals and prisons. It also shows how architecture and design can influence well-being in hospital and secure forensic settings. Moreover, interdisciplinary theoretical models and methods are presented which can help to understand the complex relationships between well-being and physical environment and how "good spaces" can contribute to healing and rehabilitation processes. In addition to scientists, the results will be of particular interest to (forensic) mental health services and political decision-makers who organize and finance construction projects in the areas addressed here due to the overcrowding situation.

Synthesis and Conclusion

In some western countries, prisons and forensic psychiatric facilities are overcrowded. Overcrowding creates significant challenges in the management of prisoners and patients. Crowding or lack of space has been linked to additional mental health problems and well-being issues, but a significant

correlation between overcrowding and higher rates of aggression and violence cannot be inferred beyond doubt (view section "Results" for details). However, it can be expected that occupancy rates of more than 10% above the structural or organizational maximum increase health risks in prisons and on psychiatric wards. This applies to prisoners, patients as well as staff (20). One way to counter overcrowding is to expand or build new facilities. In recent years, considerable efforts have been made at the international level, both in the correctional system and for psychiatric and forensic-psychiatric hospitals, to create adequate and modern building conditions for the respective requirements of correctional and psychiatric treatment. In the meantime, there are numerous scientifically sound proposals on how rooms can and should be designed in order to achieve their respective purpose (living, therapy, leisure, rest and relaxation) from a therapeutic or a rehabilitation point of view (section "Therapy Rooms and Outdoor Therapy"). To date, there is considerable evidence that architecture and design of prisons and forensic psychiatric facilities are significantly related to measures of mental health, well-being and safety of prisoners, patients and staff (section "Architecture and Design in High Security Environments"). Recommendations for contemporary therapeutically oriented and evidence-based architecture are now available for decision-makers, and these should be taken into consideration when planning extensions or rearrangements of facilities hosting mentally ill and/or high risk populations [e.g., (43)].

The relevant publications on architecture and design in secure forensic environments come from Sweden, Netherlands, and English speaking countries (sections "Prisons" and "Forensic Hospitals"). Relevant international publications from German-speaking or Eastern countries are rare. In view of the very tense occupancy situation in the German forensic system and the construction activity taking place there, it would be desirable to scientifically accompany and evaluate this process on the basis of international experience and findings, and thus contribute to the international development in this field.

When starting new studies, detailed preliminary considerations should be made about the methodological design of the study. A number of different methodological approaches have been used in international research to date (e.g., multisite studies, one site study; cross-sectional, prospective longitudinal; quasi-experimental, qualitative; regression analysis, principal component analysis, multilevel model). In order to capture the effects of and the interaction with the physical environment at different levels (users/patients/inmates; staff/therapists/nurses; institution), several approaches are needed (multilevel/multimethod, etc.), but all of them must be precisely adapted to the conditions of the respective (research) environment in which they take place. The international development in this field has shown how important flexibility is in the selection of suitable methodological approaches for the respective scientific questions [Australia is an impressive example of this, cf. (47)]. In our view, it would not be expedient to limit the relevant research to a generally valid standard, especially since the basic knowledge about specific effects and the knowledge about suitable survey and research instruments can still be extended. To this purpose, a set of key variables and dimensions has to be defined and sound instruments have to be developed.

On a theoretical level, normalization theory was a landmark in therapeutic architecture, as was the Safewards model for promoting safety in psychiatric care (39), but new models building on NT have acknowledged the limitations of deinstitutionalization and propose a synthesis of normalized and purposeful architectures and designs (37, 57). Moreover, the question remains as to what extent theories from therapeutic environments are applicable in high security environments (prison, forensic hospital). The impact of the physical environment on treatment, rehabilitation, safety and well-being in high-security environments needs further study.

In all research efforts in this field of work, much more attention must be paid to the cultural dependence of research approaches and results. Prison and forensic services are highly country-specific. Therefore, efforts have to be made to generate evidence-based knowledge on best practices in architecture and design in high security contexts which reflect cultural effects and diversity.

AUTHOR CONTRIBUTIONS

TR and MF conducted the literature search. TR wrote, reviewed, and supervised the manuscript. MF wrote, edited, and reviewed the manuscript. JB contributed to content aspects and reviewed the manuscript. All authors contributed to the article and approved the submitted version.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2022.894520/full#supplementary-material

REFERENCES

1. Jansman-Hart EM, Seto MC, Crocker AG, Nicholls TL, Côté G. International trends in demand for forensic mental health services. *Int J Forensic Ment Health.* (2011) 10:326–36. doi: 10.1080/14999013.2011.625591
2. Wik A, Hollen V, Fisher WH. Forensic patients in state psychiatric hospitals: 1999–2016. *CNS Spectr.* (2020) 25:196–206. doi: 10.1017/s1092852919001044
3. Priebe S, Frottier P, Gaddini A, Kilian R, Lauber C, Martínez-Leal R, et al. Mental health care institutions in nine European countries, 2002 to 2006. *Psychiatr Serv.* (2008) 59:570–3. doi: 10.1176/ps.2008.59.5.570
4. Priebe S, Badesconyi A, Fioritti A, Hansson L, Kilian R, Torres-Gonzales F, et al. Reinstitutionalisation in mental health care: comparison of data on service provision from six European countries. *BMJ.* (2005) 330:123–6. doi: 10.1136/bmj.38296.611215.AE
5. Salize HJ, Dressing H. Admission of mentally disordered offenders to specialized forensic care in fifteen European Union member states. *Soc Psychiatry Psychiatr Epidemiol.* (2007) 42:336–42. doi: 10.1007/s00127-007-0159-2
6. Páv M, Skřivánková P, Wiseman C, Vňuková M, Blatníková Š, Hollý M. Forensic treatment services in the Czech republic: current state and future

challenges. *Int J Forensic Ment Health.* (2020) 19:269–82. doi: 10.1080/14999013.2020.1732505
7. Seppänen A, Joelsson P, Ahlgren-Rimpiläinen A, Repo-Tiihonen E. Forensic psychiatry in Finland: an overview of past, present and future. *Int J Ment Health Syst.* (2020) 14:1–8. doi: 10.1186/s13033-020-00362-x
8. Hill SA, Riordan-Eva E, Hosking A. Trends in the number of restricted patients in England and Wales 2003–2016: implications for forensic psychiatry services. *Med Sci Law.* (2019) 59:42–8. doi: 10.1177/0025802419825596
9. Keown P, McKenna D, Murphy H, McKinnon I. Offenders with mental disorders in prison and the courts: links to rates of civil detentions and the number of psychiatric beds in England–longitudinal data from 1984 to 2016. *BJPsych Open.* (2019) 5:e93. doi: 10.1192/bjo.2019.73
10. Ross T, Fontao MI, Bulla J. Rising inpatient numbers in forensic security hospitals of German federal state of Baden-Württemberg: background and explanatory approaches. *Behav Sci Law.* (2020) 38:522–36. doi: 10.1002/bsl.2481
11. Traub HJ, Tomlin J, Weithmann G, Flammer E, Völlm B. Court sentences to forensic-psychiatric treatment and imprisonment in Germany: types of crimes and changes from 1995 to 2009. *Int J Law Psychiatry.* (2020) 71:101577. doi: 10.1016/j.ijlp.2020.101577
12. Traub HJ, Weithmann G. Maßregelvollzug nach §63 StGB. Entwicklungen in den Bundesländern. [Forensic psychiatry in Germany. Comparison of different trends of expansion in the different states of Germany]. *Der Nervenarzt.* (2008) 79:594–603.
13. Weithmann G, Traub HJ, Flammer E, Völlm B. Comparison of offenders in forensic-psychiatric treatment or prison in Germany. *Int J Law Psychiatry.* (2019) 66:101502. doi: 10.1016/j.ijlp.2019.101502
14. Clark C, Myron R, Stansfeld S, Candy B. A systematic review of the evidence on the effect of the built and physical environment on mental health. *J Public Ment Health.* (2007) 6:14–27. doi: 10.1108/17465729200700011
15. Roxberg Å, Tryselius K, Gren M, Lindahl B, Werkander Harstäde C, Silverglow A, et al. Space and place for health and care. *Int J Qual Stud Health Well Being.* (2020) 15:1750263. doi: 10.1080/17482631.2020.1750263
16. Government Accountability Office. *A Report to Congressional Requesters: Bureau of Prisons. Growing Inmate Crowding Negatively Affects Inmates, Staff, and Infrastructure (GAO-12-743)*. Washington, DC: Government Accountability Office (2012).
17. Swedish Prison and Probation Service, Research and Evaluation Unit. *How Architecture and Design Matter for Prison Services: A Rapid Review of the Literature*. Norrköping: Kriminalvården (2018).
18. Seppänen A, Törmänen I, Shaw C, Kennedy H. Modern forensic psychiatric hospital design: clinical, legal and structural aspects. *Int J Ment Health Syst.* (2018) 12:1–12. doi: 10.1186/s13033-018-0238-7
19. Linton M-J, Dieppe P, Medina-Lara A. Review of 99 self-report measures for assessing well– being in adults: exploring dimensions of well-being and developments over time. *BMJ Open.* (2016) 6:e010641. doi: 10.1136/bmjopen-2015-010641
20. Virtanen M, Vahtera J, Batty GD, Tuisku K, Pentti J, Oksanen T, et al. Overcrowding in psychiatric wards and physical assaults on staff: data-linked longitudinal study. *Br J Psychiatry.* (2011) 198:149–55. doi: 10.1192/bjp.bp.110.082388
21. Kapoor M. Ward overcrowding and assaults on staff: cause and effect? *Br J Psychiatry.* (2011) 198:408–9. doi: 10.1192/bjp.198.5.408b
22. Weltens I, Bak M, Verhagen S, Vandenberk E, Domen P, van Amelsvoort T, et al. Aggression on the psychiatric ward: prevalence and risk factors. A systematic review of the literature. *PLoS One.* (2021) 16:e0258346. doi: 10.1371/journal.pone.0258346
23. Haney C. Prison overcrowding. In: Cutler BL, Zapf PA editors. *APA Handbook of Forensic Psychology: Criminal Investigation, Adjudication, and Sentencing Outcomes*. Vol. 2. (Washington, DC: American Psychological Association) (2015). p. 415–36.
24. Martin JL, Lichtenstein B, Jenkot RB, Forde DR. "They can take us over any time they want" correctional officers' responses to prison crowding. *Prison J.* (2012) 92:88–105. doi: 10.1177/0032885511429256
25. Baggio S, Peigné N, Heller P, Gétaz L, Liebrenz M, Wolff H. Do overcrowding and turnover cause violence in prison? *Front Psychiatry.* (2020) 10:1015. doi: 10.3389/fpsyt.2019.01015
26. Rabe K. Prison structure, inmate mortality and suicide risk in Europe. *Int J Law and Psychiatry.* (2012) 35:222–30. doi: 10.1016/j.ijlp.2012.02.012
27. Wolff H, Casillas A, Perneger T, Heller P, Golay D, Mouton E, et al. Self-harm and overcrowding among prisoners in Geneva, Switzerland. *Int J Prison Health.* (2016) 12:39–44. doi: 10.1108/IJPH-04-2015-0009
28. Franklin TW, Franklin CA, Pratt TC. Examining the empirical relationship between prison crowding and inmate misconduct: a meta-analysis of conflicting research results. *J Crim Justice.* (2006) 34:401–12. doi: 10.1016/j.jcrimjus.2006.05.006
29. Walker J, Illingworth C, Canning A, Garner E, Woolley J, Taylor P, et al. Changes in mental state associated with prison environments: a systematic review. *Acta Psychiatr Scand.* (2014) 129:427–36. doi: 10.1111/acps.12221
30. Fazel S, Ramesh T, Hawton K. Suicide in prisons: an international study of prevalence and contributory factors. *Lancet Psychiatry.* (2017) 4:946–52. doi: 10.1016/s2215-0366(17)30430-3
31. van Ginneken EFJC, Sutherland A, Molleman T. An ecological analysis of prison overcrowding and suicide rates in England and Wales, 2000–2014. *Int J Law Psychiatry.* (2017) 50:76–82. doi: 10.1016/j.ijlp.2016.05.005
32. Connellan K, Gaardboe M, Riggs D, Due C, Reinschmidt A, Mustillo L. Stressed spaces: mental health and architecture. *HERD.* (2013) 6:127–68. doi: 10.1177/193758671300600408
33. Carthey J. Post occupancy evaluation: development of a standardised methodology for australian health projects. *Int J Constr Manag.* (2006) 6:57–74. doi: 10.1080/15623599.2006.10773082
34. Vischer JC. Applying knowledge on building performance: from evidence to intelligence. *Intell Build Int.* (2009) 1:239–48. doi: 10.3763/inbi.2009.SI02
35. Aljunaidy MM, Adi MN. Architecture and mental disorders: a systematic study of peer-reviewed literature. *HERD.* (2021) 14:320–30. doi: 10.1177/1937586720973767
36. Nirje B. The basis and logic of the normalization principle. *Aust N Z J Dev Disabil.* (1985) 11:65–8. doi: 10.3109/13668258509008747
37. Chrysikou E. From normalization theory to a "fit for purpose" architecture for the mentally ill. *World Health Design* (2012) 5:68–77.
38. Oostermeijer S, Brasier C, Harvey C, Hamilton B, Roper C, Martel A, et al. Design features that reduce the use of seclusion and restraint in mental health facilities: a rapid systematic review. *BMJ Open.* (2021) 11:e046647. doi: 10.1136/bmjopen-2020-046647
39. Bowers L. Safewards: a new model of conflict and containment on psychiatric wards. *J Psychiatr Ment Health Nurs.* (2014) 21:499–508. doi: 10.1111/jpm.12129
40. Finch K, Lawrence D, Williams MO, Thompson AR, Hartwright C. A systematic review of the effectiveness of safewards: has enthusiasm exceeded evidence? *Issues Ment Health Nurs.* (2022) 43:119–36. doi: 10.1080/01612840.2021.1967533
41. Sinclair T. What's in a therapy room? A mixed-methods study exploring clients' and therapists' views and experiences of the physical environment of the therapy room. *Couns Psychother Res.* (2021) 21:118–29. doi: 10.1002/capr.12376
42. Jones JK. A place for therapy: clients reflect on their experiences in psychotherapists' offices. *Qual Soc Work.* (2020) 19:406–23. doi: 10.1177/1473325020911676
43. Noble L, Devlin AS. Perceptions of psychotherapy waiting rooms: design recommendations. *HERD J.* (2021) 14:140–54. doi: 10.1177/19375867211001885
44. Backhaus KL. *Client and Therapist Perspectives on the Importance of the Physical Environment of the Therapy Room: A Mixed Methods Study Doctoral Dissertation*. Denton, TX: Texas Woman's University (2008).
45. Cooley SJ, Jones CR, Kurtz A, Robertson N. 'Into the Wild': a meta-synthesis of talking therapy in natural outdoor spaces. *Clin Psychol Rev.* (2020) 77:101841. doi: 10.1016/j.cpr.2020.101841
46. St John VJ. Placial justice: restoring rehabilitation and correctional legitimacy through architectural design. *SAGE Open.* (2020) 10:2158244020919503. doi: 10.1177/2158244020919503
47. Grant E, Jewkes Y. Finally fit for purpose: the evolution of Australian prison architecture. *Prison J.* (2015) 95:223–43. doi: 10.1177/0032885515575274
48. Beijersbergen KA, Dirkzwager AJ, van der Laan PH, Nieuwbeerta P. A social building? Prison architecture and staff–prisoner relationships. *Crime Delinq.* (2016) 62:843–74. doi: 10.1177/0011128714530657

49. Morris RG, Worrall JL. Prison architecture and inmate misconduct: a multilevel assessment. *Crime Delinq.* (2014) 60:1083–109. doi: 10.1177/0011128710386204
50. Olausson S, Wijk H, Johansson Berglund I, Pihlgren A, Danielson E. Patients' experiences of place and space after a relocation to evidence-based designed forensic psychiatric hospitals. *Int J Ment Health Nurs.* (2021) 30:1210–20. doi: 10.1111/inm.12871
51. Wijk H, Degl'Innocenti A, Kullgren A, Alexiou E. Evidence-based design has a sustainable positive effect on patients' perceptions of quality of care in forensic psychiatry: a 3-year follow-up Study. *J Forensic Nurs.* (2019) 15:60–8. doi: 10.1097/jfn.0000000000000226
52. Degl'Innocenti A, Wijk H, Kullgren A, Alexiou E. The influence of evidence-based design on staff perceptions of a supportive environment for person-centered care in forensic psychiatry. *J Forensic Nurs.* (2020) 16:E23–30. doi: 10.1097/JFN.0000000000000261
53. Eggert JE, Kelly SP, Margiotta DT, Hegvik DK, Vaher KA, Kaya RT. Person–environment interaction in a new secure forensic state psychiatric hospital. *Behav Sci Law.* (2014) 32:527–38. doi: 10.1002/bsl.2127
54. Van der Schaaf PS, Dusseldorp E, Keuning FM, Janssen WA, Noorthoorn EO. Impact of the physical environment of psychiatric wards on the use of seclusion. *Br J Psychiatry.* (2013) 202:142–9. doi: 10.1192/bjp.bp.112.118422
55. Rogerson M, Haines-Delmont A, McCabe R, Brown A, Whittington R. The relationship between inpatient mental health ward design and aggression. *J Environ Psychol.* (2021) 77:101670. doi: 10.1016/j.jenvp.2021.101670
56. Kartha MR, McCrone P. Cost-effectiveness of staffing levels on conflict and containment on psychiatric wards in England. *J Psychiatr Ment Health Nurs.* (2019) 26:337–46. doi: 10.1111/jpm.12545
57. Chrysikou E. Psychiatric institutions and the physical environment: combining medical architecture methodologies and architectural morphology to increase our understanding. *J Healthc Eng.* (2019) 2019:4076259. doi: 10.1155/2019/4076259

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers | Frontiers in Psychiatry

ORIGINAL RESEARCH
published: 12 July 2022
doi: 10.3389/fpsyt.2022.884410

Factors Affecting Treatment Regress and Progress in Forensic Psychiatry: A Thematic Analysis

Riitta Askola[1,2]*, *Olavi Louheranta*[3] and *Allan Seppänen*[1,4]

[1] Department of Psychiatry, University of Helsinki and Helsinki University Hospital, Helsinki, Finland, [2] Department of Nursing Science, Faculty of Health Sciences, University of Eastern Finland, Kuopio, Finland, [3] Niuvanniemi Hospital, Kuopio, Finland, [4] Vanha Vaasa Hospital, Vaasa, Finland

International variability and shifting trends in forensic psychiatry lead to gaps in national service provision and needs for service development. This study explores these needs through the subjective narratives of those involved in Finnish forensic services, either as forensic psychiatric patients, their parents, or service providers. Data was gathered by means of thematic interview and subjected to thematic analysis. Three main themes emerged: (1) pre-treatment challenges, (2) institutional/treatment-related concerns about therapeutic security and (3) adapting and recovery. The research highlights the need to develop forensic psychiatric services at three levels. First, it calls for increased risk awareness and risk assessment skills at the general psychiatric level. Second, it emphasizes the need for increased therapeutic engagement throughout the rehabilitative process. Third, it calls for structured and meaningful post-discharge aftercare. At all three levels, gradated security-aware standardization and patient triage in forensic services would help to develop and maintain an intact care pathway. This would decrease offending, marginalization, and suffering. Only then can we begin to meet the requirements of the WHO European Mental Health Action Plan. These findings can contribute to the development of international, standardized treatment models for clinical forensic psychiatric practices.

Keywords: forensic psychiatric services, deinstitutionalization, transinstitutionalization, reform of mental health legislation, national quality standards

OPEN ACCESS

Edited by:
Judith Streb,
Universitaetsklinikum Ulm, Germany

Reviewed by:
Märta Wallinius,
Lund University, Sweden
Alexander Ian Frederic Simpson,
University of Toronto, Canada

***Correspondence:**
Riitta Askola
riitta.askola@welho.com

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: *26 February 2022*
Accepted: *23 June 2022*
Published: *12 July 2022*

Citation:
Askola R, Louheranta O and Seppänen A (2022) Factors Affecting Treatment Regress and Progress in Forensic Psychiatry: A Thematic Analysis. Front. Psychiatry 13:884410. doi: 10.3389/fpsyt.2022.884410

INTRODUCTION

The World Health Organization's European' Mental Health Action Plan 2013–2020 (WHO action plan) (1) strives to (a) improve the mental wellbeing of the population and reduce the burden of mental disorders, with a special focus on vulnerable groups, exposure to determinants and risk behaviors, (b) respect the rights of people with mental health problems and offer equitable opportunities to attain the highest quality of life, whilst addressing stigma and discrimination, (c) establish accessible, safe, and effective services that meet people's mental, physical, and social needs and the expectations of people with mental health problems and their families. To this end, the WHO proposes a reorganization of mental health services, including continuing psychiatric deinstitutionalization and increased provision of easily accessible local services.

Implementing the WHO proposals is not yielding the expected results. For instance, while the overall number of general psychiatric hospital beds has indeed decreased, the number of places in other institutions, including prisons, forensic units and supported housing has increased, in an apparent process of transinstitutionalization (2, 3). In Western Europe from 1990 to 2000, the number of psychiatric hospital beds decreased on average by 42.5 beds per 100 000 inhabitants, and from 2000 to 2012 the decrease was 22.44; at the same time, forensic beds rose by an average of 0.49 between 1990 and 2000 and 0.76 between 2000 and 2012 (2). Suggested reasons for the increase in the number forensic psychiatric beds, in addition to the decrease in general psychiatric bed provision, include an increase in comorbid substance abuse, increased risk aversion in society (4), and the loss of social support for mentally ill people in traditional families (5). Whatever the specific determinants prove to be, these trends have nonetheless caused a significant strain on psychiatric services (6, 7) – institutional or otherwise – and a need, in many countries, to reassess the role, quality, and organization of forensic services (8–11).

Forensic mental health services (FMHSs) are primarily designed to provide treatment in conditions of therapeutic security for persons with severe and often disabling mental disorders and offending behaviors (12). Thus, forensic psychiatric treatment is either an independent medical specialty in some countries, including Finland (13), or a recognized subspeciality in others (14). Specific attributes of forensic treatment include the need for risk awareness and risk assessments in clinical decision making, multifaceted conceptualization of security (15, 16), common presence of clinical comorbidity, effect of legal stipulations arising from patients' offending history, and lengthy treatment periods (17, 18). Institutional FMHSs are high cost, high risk and low volume, and thus must yield high value in health gains and risk management (19, 20).

Despite international attempts to coordinate forensic mental health service organization and legislation, the forensic patient population differs significantly from one country to another even within the European Union (EU). Questions of criminal responsibility, diversion mechanisms from the criminal sanctions agencies and many aspects of involuntary treatment are defined by national legislation, rather than international, evidence-based models of care (21–24). Bed numbers and treatment duration have increased in several EU states, but not in others. Reasons for this may be social, political, and economic, such as a country's GDP and healthcare spending, the relationship between prison places and psychiatric beds (25), cultures of risk containment, familial and community support structures, levels of poverty, and legal frameworks (26).

Over time, forensic services and patient populations change. Degl' Innocenti et al. (27) indicated a significant shift in their register-based study of Swedish forensic patients in 2010 and 2018: from inpatient to outpatient care, from first-generation antipsychotics to second-generation antipsychotics, and to shorter lengths of stay, particularly for men. Use of physical restraints and forced medication diminished while less severe restrictions, e.g., on communication rights, increased.

Finland has a national mental health policy for 2010–2015 (28) and national mental health strategy and suicide prevention program for 2020–2030 (29). Echoing the WHO action plan, the national mental health policy emphasized the development of community services, downsizing institutional care, and the closure of separate mental hospitals whilst strengthening preventive strategies, collaboration between different administrative branches of health and social care providers, and supporting mental health capacity in primary care (28).

Traditionally, in Finland forensic psychiatry has had three main functions: (1) providing forensic psychiatric assessments for courts deciding on criminal responsibility, (2) providing treatment to those offenders who are not sentenced based on criminal irresponsibility, (3) and treating patients who have been transferred from general psychiatric units as their treatment is dangerous or difficult (13, 30). In Finland (population ca. 5, 5 M), ca. 80–100 forensic psychiatric assessments are currently produced per year (down from ca. 300 in previous decades) and about 30–35 offenders are annually committed to involuntary forensic treatment for a median of 5–9 years (13, 31–34). Finland has two state forensic hospitals, university hospital forensic units, and prison psychiatric services. Prison security standards cover prison healthcare units, but Finnish forensic unit security standards, as defined for instance by UK professional bodies and medicolegal authorities (35–37), do not adhere to anything akin to high or medium security. In fact, there are no national standards or legal stipulations whatsoever concerning the physical, operative, and security attributes of forensic services. Instead of preventive action, Finnish medicolegal authorities rely on reactive ex-post monitoring of individual cases.

In the following, we explore the gaps in forensic services in Finland through the subjective narratives of those involved, as patients, carers, or service providers. More specifically, we were interested in which factors in the services affect treatment regress and progress, and, accordingly, how could the services be developed based on these insights.

METHODS

Participants

Eight forensic psychiatric patients ($n = 8$), the parents of six forensic psychiatric patients ($n = 6$), and nine forensic psychiatric nurses ($n = 9$) from two forensic psychiatric hospitals in Finland were interviewed. The inclusion criteria for the patients were: 1) age over 18, (2) mentally stable enough to participate (i.e., no excessive anxiety anticipated due to participating), and (3) sufficient proficiency in Finnish. The exclusion criteria were mental instability (acutely psychotic, suffering from anxiety, likely to self-harm, or in the personnel's estimation likely to be adversely affected by participating in the proposed study). The patients, all aged 30–50, were either inpatients ($n = 6$), or outpatients ($n = 2$) discharged by the National Institute for Health and Welfare (THL) under supervision and living in psychiatric rehabilitation units. Their index offenses included homicides (four patients), crimes against property (one patient),

assaults (two patients) and arson (one patient). Seven patients were men and one was a woman.

The inclusion criteria for the parents/carers were: (1) being a parent of forensic psychiatric patients, (2) willingness to participate in the study, (3) patient's permission to contact the parents. Five of the parents were women, and one was a man.

The inclusion criterion for forensic psychiatric staff participant selection was being a registered nurse (RN) or mental health nurse acting as a named nurse. The sample selection was based on the relevance of the nurses' experience, with all nurses selected having at least 10 years' psychiatric nursing and 5 years' forensic psychiatric nursing experience. Eight of the nurses worked in an inpatient setting, whereas one in an outpatient forensic clinic. Five nurses were men and four were women.

Procedure

Ethical approval for the study was obtained from the Ethics Committee of the Hospital District of Helsinki and Uusimaa. Formal approval and permission for data collection in the relevant treatment units and from the parents of forensic psychiatric patients were granted. Having obtained permission for data collection the researcher (RA) informed nurse managers and the staff on the wards and out-patient clinics about the study. The staff suggested suitable patients whom they thought would not be distressed by the study and who were in a stable enough condition to participate in relatively lengthy interviews. The nursing personnel assessed the parents of those forensic psychiatric patients whom they estimated would be willing and able to participate in the proposed study. After this assessment, they requested their patients' permission to contact the parents. The nurses informed both the patients and their parents about the study, and if both parties agreed, they passed on the parents' contact information to the researcher. The researcher then contacted the parents with more detailed verbal and written information about the study, after which each parent signed an informed consent form. The researcher had had no part in the treatment of the patients whose parents were to be interviewed.

The interviews were performed independently of each other. The researcher was not previously known to the nurses, or the patients interviewed, or the parents of the forensic psychiatric patients. Also, the nursing staff and parents in this study were not those of the studied patients. Participants were given written and verbal information regarding the study and formal informed consent was obtained from all participants. The researcher (RA) conducted all the thematic interviews herself. Thematic interview was chosen as a method, as it allows acquiring qualitative information about a topic or about a field which is relatively less known or rarely studied. It focuses on subjective experiences as defined and narrated by the interviewees and accepts this as valid material for scientific scrutiny (38, 39).

All interviews were recorded except two, as the patient and the parent concerned objected. For these two interviews, the researcher took notes instead. The participants were asked to describe factors affecting treatment regress and progress in forensic psychiatry in their own words. Some of the guiding questions asked during the interview process concerned challenges in treatment and recovery. All interviews were transcribed verbatim. A total of 194 pages of material (1.5 spacing) resulted. Of these, 98 pages concerned the interviews with patients, 27 pages concerned the interviews with the parents, and 69 pages, the interviews with nurses. The research material was meaningful as it represented authentic experiences and gave the subjects themselves a voice to a sensitive subject.

Analysis

Inductive thematic analysis was applied to the data. In inductive analysis, the data is coded without using an existing framework and aiming to avoid the analyst's' preconceptions (40). A key aim of the process of coding and thematic analysis is to retain detail in the data items; codes are labels applied to segments of data which are likely to be relevant in the context of the research questions (41). Thematic analysis is suited to analyzing subjective experiences, perceptions, and understandings (41, 42). It can be used to identify, analyze, and report patterns (themes) in qualitative data, particularly for examining the perspectives of different research participants, highlighting similarities and differences, and generating unanticipated insights (40). Therefore, data from the forensic psychiatric patients, their parents, and their nurses, were analyzed together.

The data was analyzed in six phases (40), by utilizing guidelines and tools to support the process of conducting a rigorous and trustworthy thematic analysis (43, 44). First, the researcher listened to the audiotapes and read the transcripts several times to develop a thorough understanding of them. Second, the researcher generated initial codes to identify each feature of the data that appeared noteworthy. The entire data set was organized into groups according to the codes. Coding was done manually and no qualitative data analysis software was used in analyzing the data. Third, the codes were sorted into potential themes, with consideration of how codes could combine in an overarching theme. Fourth, the themes worked were checked against the coded extracts and the data as a whole. A candidate thematic map of the analysis was generated. Fifth, the themes were defined and named, and sub-themes identified. Again the coherence of and relationship between the themes were checked. Sixth, the report was produced after selection of compelling extract examples that related to the research question.

RESULTS

Three main themes emerged from the data: (1) pre-treatment challenges, (2) institutional/treatment-related concerns about therapeutic security, (3) adapting and recovery. Each theme included subthemes. These factors affecting treatment regress and progress in the process of forensic rehabilitation are illustrated in **Figure 1**.

Pre-treatment Challenges

This main theme contained three sub-themes: social problems before the offense, lack of adequate support by various services, and inadequate treatment.

Within all three groups of interviewees (patients = P, parents (carers) = C, nurses = N), answers indicated that before the

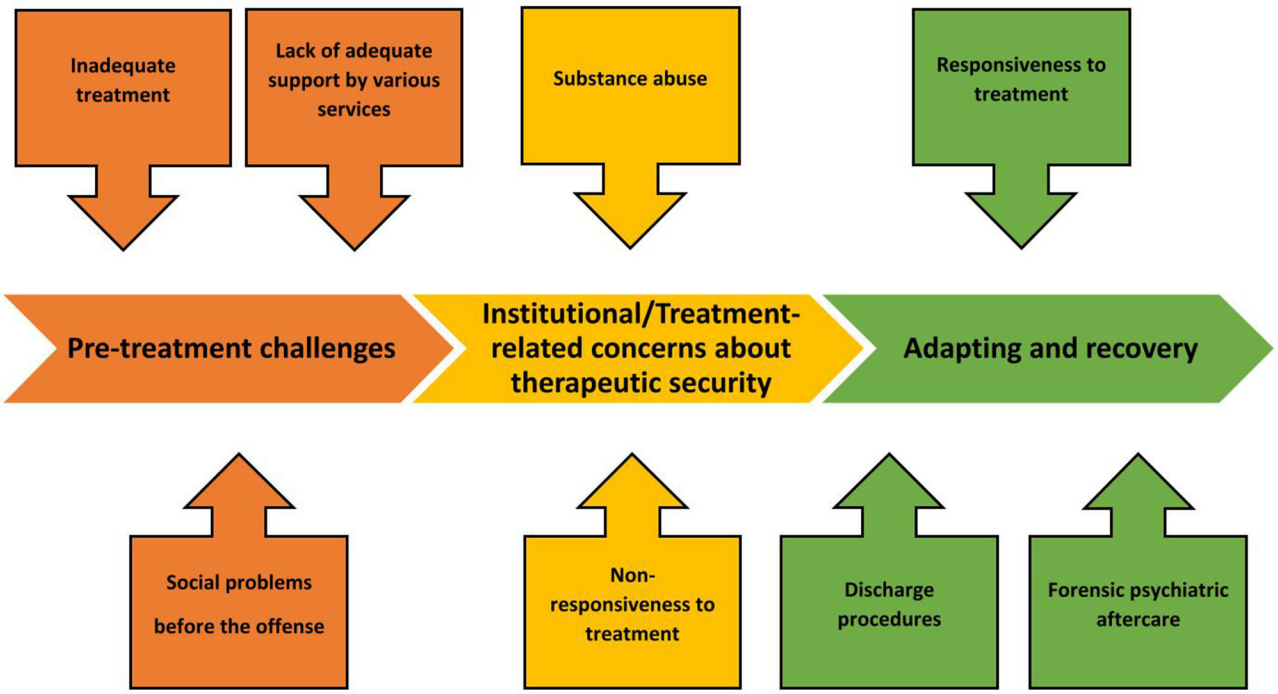


FIGURE 1 | Factors affecting treatment regress and progress along the forensic rehabilitation process. The main themes are (1) pre-treatment challenges, (2) institutional/treatment-related concerns about therapeutic security and (3) adapting and recovery. For each main theme, (1–3) subthemes emerged, as illustrated.

offense patients had considerable social difficulties, such as early-onset offending behavior, social marginalization, substance abuse, criminal recidivism, and prison re-entry.

> I was continually in and out of prison, like the judge said in court "You don't really enjoy civilian life, do you?", which was true, I found it easier in prison. P8

Parents felt they had not received adequate support from the healthcare services and sometimes they had had to deal with the judiciary after their child had assaulted them. Indeed, a recurring theme in the narratives of some parents was being repeatedly victimized by their child but not getting help from the police. In addition to the offense and risk behavior, they were burdened by violence, the stigma of familial mental illness, and the breakdown of family relations.

> I told the doctor you really need to get him into treatment, look at how bruised I am. I'm being kicked around. He felt there was not enough evidence for that, not enough on the computer. What more should happen? Not enough indications, or what was it he said? C1

Before the index offense, patients had often been committed to involuntary treatment several times, without receiving adequate treatment. Patients in risk of offending behavior either were not recognized as such or the risk was not managed assertively enough. Parents also felt that they had not been included in the treatment process, or they had been inadequately informed.

> He was so intimidating there, so intimidating that they were afraid to keep him there. N9
>
> He was there for only a week, and then into the community. So that didn't work at all. Well, they were supposed to make home visits, but he didn't let them in and they said they hadn't the authority to do anything. C2

Institutional/Treatment-Related Concerns About Therapeutic Security

This main theme contained two sub-themes: non-responsiveness to treatment and substance use.

The patients' or their parents often had a negative attitude to forensic assessment and treatment. One parent questioned the timing of the forensic assessment, claiming that it was too early with respect to recovery, thus distorting the outcome. One patient said that his prison sentence for the index offense would have been shorter than the treatment order, which he compared to a life sentence.

> I think that's total bullshit, I'm not insane. I belong in prison. I would have rather been in prison. If I had been sentenced, I would have been out years ago. Now it takes longer. P1

Being a parent of a forensic patient can be ethically challenging, as parents may possess information on issues that could be valuable in terms of forensic treatment, but could prolong the treatment period or have other unwarranted effects. Parents could also blame the service providers for the index offense and refuse to collaborate.

> As a mother she opposes treatment and medication, like, her child doesn't need medication. N9

Treatment progress could be affected by the patient's lack of treatment motivation and engagement, or by a particularly challenging, drug-resistant disorder. One nurse described how his patient had been on electro-convulsive therapy (ECT) and various medications, at maximum doses, without intended clinical results. According to the interviewee, this created the need to resort to various restrictive practices, such as seclusion.

> Very ill and drug-resistant in addition to everything else, like new medication trials are done continuously, and ECT was given during the winter… but he is more or less agitated, anxious, and that results in him envisioning how he would stab for instance me or someone else. If he has very intense thoughts about harming himself or his roommate, he can be placed in seclusion. N7

Nursing staff recognized the formation of various subcultures among patients, which centered around substance abuse. These subcultures affected inter-patient dynamics and the ward environment by increasing restlessness and decreasing commitment to treatment measures.

> One becomes quite restless, in a way. Is there something going on, are there drugs in the hospital, are there thoughts of escape or is there something you know, that you don't want to know about? There can be all kinds of things going on among the patients, which even the nurses don't necessarily know about. N8

Substance misuse had a negative impact on treatment. According to one nurse, a patient who had progressed well in terms of rehabilitation, was in risk of reverting back to substance misuse and resultant apathy, loss of circadian rhythm, and addiction.

> Substance abuse is the worst, there's no interest in studies or anything, they're addicted to drugs and those circles, and they mess about and we can't seem to catch them. N9

The risk of substance abuse was perceived as particularly pressing after discharge, due to its connection with offending behavior.

> In the end I became addicted. I think that if I had stayed in hospital, perhaps these things would never have happened. P3

Adapting and Recovery

This main theme contained three sub-themes: responsiveness to treatment, discharge procedures, and forensic psychiatric aftercare.

Treatment adherence expedited rehabilitation. Particularly, adherence to medication was seen as pivotal.

> And I think medication is really important, I'm sure to be using it for the rest of my life, so nothing like this will ever happen again and I can live a so-called normal life and cope with this illness in the future too. P2

Treatment adherence was also affected by the quality of the therapeutic alliance that patients and staff were able to form. Indeed, both staff and patients emphasized the importance of cultivating a trustful and accepting relationship.

> You notice, when in conversations your thoughts start being on the same level, that you're forming that connection; then it starts working. P8
>
> The patient starts to understand that we're actually on the same side here. That we're trying to push him out of here, not hold him back, no confrontation. N2

Collaboration with parents, supporting them, and offering psychoeducation, group interventions and peer-support became increasingly important as treatment progressed toward life outside the hospital.

> We had one of those anger management groups here. Luckily, I've participated in groupwork, it has helped. P1
>
> Usually, I go through what has happened during the week. I attend because it helps me keep my problem in mind, so that it doesn't just diminish and diminish, and then, finally, I take that first beer. P8

One patient described how supportive and understanding his family had been about his situation.

> They've understood me really well, there's been no schism. I'm quite happy about how they've taken it. P2

All interviewee groups stressed the importance of being drugfree.

> I'm gonna do really well, as long as drugs and crime don't enter into the picture. P7

The interviewees maintained that successful forensic rehabilitation required that the index offense had been emotionally and cognitively integrated into the life story of the patient. This enabled the patient to focus on making concrete and realistic plans, and to move on in life. This, in turn, provided aspiration and structure.

> I can ask him anything, and he can be, like, "I would never do that again," and he regrets it so much and is aware of his illness and does not resist medication. N1

The interviewed nurses underlined the importance of practicing various life skills and self-control as rehabilitation became increasingly focused on life outside hospital. The patients emphasized the meaning of independent or semi-independent living conditions, supported employment, recreational hobbies, and close relationships.

> To recover so that I can live independently, that is what I'm aiming for. And I'll go to work at the occupational center, have hobbies, see my family. P3

One carer emphasized the importance of meaningful activities, based on patients' individual skillsets and predilections.

> At the hospital the therapist said that they have trouble finding him meaningful work, because of his high skill-level, particularly in metalwork. He said from the beginning that he

always had aspirations, he was always making plans, for when he gets out. C3

DISCUSSION

Our research highlights three areas for development in forensic psychiatric services. First, it calls for increased risk awareness and risk assessment skills at the general psychiatric level. Second, it emphasizes the need for increased therapeutic engagement throughout the rehabilitative process. Third, it calls for structured and meaningful post-discharge aftercare. The results of this study are in line with Shepherd et al. (45) whose review emphasized safety and security as a necessary basis for the recovery process, the dynamics of hope and social networks in providing support and work on identity as an integral driver of change throughout the recovery process.

It has been estimated that as many as 75% of forensic patients have had contact with psychiatric services before their index offense (46), and that their hospitalizations prior to this offense have been longer than other patients' (47). Also, compared with other psychiatric patients, forensic patients have had more interruptions in education, as well as a higher degree of antisocial behavior (47, 48), social marginalization and childhood exposure to parental alcohol abuse (49). To develop services in line with the WHO action plan, pre-emptive interventions need to be made available at the most accessible, basic level in order to better serve the needs of this vulnerable group. Youth work, general medical and psychiatric services, and emergency units should also have access to specialist, individualized forensic consultations (50, 51). According to Kennedy (20), individual needs must be respected within forensic services. Processes for triage, allocation, and waiting-list management should be clearly defined to ensure that pathways function quickly in response to needs. Triage criteria should focus on the patient rather than the institution and should be described in meaningful units of difference or reliable change (20).

Bearing in mind the many life-long challenges forensic patients typically face, it is important to consider variables that not only relate the time before and during forensic treatment, but also to the follow-up period, in order to identify patients at risk of criminal recidivism (52). Our research partly echoes the work by Coid et al. (53), who identified causal risk factors for violence among discharged patients and argued that poor insight, symptoms of major mental disorder, poor treatment response, low level of personal support, and unsatisfactory living conditions all increased risk of violence, when accompanied by violent ideation, behavioral instability, and stress. Similarly, empathy, coping, work, leisure activities, good financial management, motivation for treatment, positive attitudes to authority, life goals, taking medication, and positive social networks all conveyed protective effects and reduced the risk of violence, but only when accompanied by good self-control. Indeed, as Simpson and Penney (54) and others (55) point out, bridging the concepts of security and therapy is perhaps most crucial to the recovery of the forensic patient.

Commitment to treatment measures may be promoted by recovery- and strength-based practices, including peer support (56, 57), opportunities for meaningful occupation (58), and work skills programs, such as Individual Placement Support (IPS) (59). Accordingly, Livingstone (60) concluded that success in the forensic mental health system is seen as a dynamic, collaborative process rather than an end state. Markham (61), too, calls for inclusive patient collaboration throughout all facets of personal recovery, including risk management. However, in order to ensure best recovery-oriented practices, forensic psychiatric services need to be developed at several levels.

As elsewhere (8, 62), through a process of transinstitutionalization, supported housing provision in Finland has increased (63). Despite this, the continued trend of deinstitutionalization combined with changes in mental healthcare funding and associated budget cuts (7) have resulted in an increase in social marginalization, untreated substance abuse, and psychiatric morbidity (64, 65). Similarly, De Page and Titeca (66) concluded in their analysis of 10 years' routine data collection that the severity in terms of risk, psychopathic personality traits, and lack of cognitive and functional capacities of forensic psychiatric patients had increased. Chow, Ajaz, and Priebe (67) qualitatively explored the perspectives of mental health professionals on what has driven the changes in institutionalized mental health care in Western Europe. They identified four major drivers of change: the overall philosophy of deinstitutionalization, with the aim to overcome old-fashioned asylum-style care; finances, with a pressure to limit expenditure and an interest of provider organizations to increase income; limitations of community mental health care, in which most severely ill patients may be neglected; and an emphasis on risk containment so that patients posing a risk may be cared for in institutions. In short, forensic services risk becoming increasingly burdened by patients previously cared for within a more robust general psychiatric service (10, 19, 68).

All in all, in line with the WHO action plan, our research calls for increased individuality when delivering all levels of service. Meaningful activities are necessary, such as supported work, maintaining freedom from substance misuse, enabling self-determination, and a participatory role whilst engaged in the services, bearing in mind the various aspects of security (20, 69–72). Thus, passive custodial institutionalization, or warehousing, must be replaced on an individual level by interactive and dynamic therapeutic security, supported by its procedural and physical counterparts, i.e., the institutional facets of security. Thus, high-quality forensic psychiatric services rely on appropriate hospital design, considering the typically long treatment periods and unique needs of many forensic patients (73).

We believe that the development and implementation of national quality standards, such as the gradated standards for low, medium (74), and high (75) security units in the UK, would be advisable within both Finnish institutional and community forensic mental health services (76). The upcoming reform of mental health legislation should consider the wider applicability of involuntary outpatient treatment, as suggested in a white paper commissioned by the Finnish Ministry of Social Affairs

and Health (28). Development of forensic psychiatric services at all levels – including gradated security-aware standardization and patient triage – could help maintain an intact care pathway, to decrease offending, marginalization, and suffering. Only then can Finland begin to meet the requirements of the WHO Mental Health Action Plan for Europe.

STRENGTHS AND LIMITATIONS OF THE RESEARCH

This was a qualitative study using a small sample recruited from two forensic psychiatric hospitals in Finland. The findings are considered to represent authentic experiences of eight forensic psychiatric patients, six parents of forensic psychiatric patients, and nine forensic psychiatric nurses. Our study has some limitations. We had a relatively small study sample, and the results may not be representative of all international forensic settings. However, our participants were experts in their area, with plenty of lived experiences.

CONCLUSIONS AND FUTURE DIRECTIONS

The results show that ensuring best recovery-oriented practices in forensic psychiatric services need to be developed at several levels. Our research calls for increased individuality when delivering forensic psychiatric services, within the context of gradated security-aware service standardization and patient triage. Risk awareness and risk assessment skills at the general psychiatric level should be increased and supported by forensic expertise in order to develop the continuum of national service provision. Non-responsiveness to treatment and substance use are linked to physical, procedural and relational security. Therefore, increased therapeutic engagement is required throughout the rehabilitative process. Structured and meaningful post-discharge aftercare needs to be developed. This calls for more diverse and meaningful activities and patient involvement. To close the identified gaps in services and to create gradated security-aware processes for patient treatment and triage, Finland needs to develop and implement national standards for forensic psychiatric care.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of the Hospital District of Helsinki and Uusimaa. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

RA, OL, and AS contributed to the conception and design of the study and wrote the initial draft of the manuscript. RA acquired and analyzed the data and acted as the auditor of results and interpretation of data. All authors worked with the thematic analysis in joint meetings. Citations were translated by AS. All authors contributed to the article and approved the submitted version.

FUNDING

This study was supported by Helsinki University Hospital, Psychiatry.

ACKNOWLEDGMENTS

We are very grateful to the patients, the parents, and the nurses who participated in the interviews.

REFERENCES

1. World Health Organization (WHO). *The European Mental Health Action Plan. Regional Committee for Europe sixty-third session*. (2013). Available online at: https://www.euro.who.int/__data/assets/pdf_file/0004/194107/63wd11e_MentalHealth-3.pdf (accessed October 31, 2021).
2. Chow WS, Priebe S. How has the extent of institutional mental healthcare changed in Western Europe? Analysis of data since 1990. *BMJ Open*. (2016) 6:e010188. doi: 10.1136/bmjopen-2015-010188
3. Schildbach S, Schildbach C. Criminalization through transinstitutionalization: a critical review of the Penrose hypothesis in the context of compensation imprisonment. *Front Psychiatry*. (2018) 9:534. doi: 10.3389/fpsyt.2018.00534
4. Gordon H, Lindqvist P. Forensic Psychiatry in Europe. *Psychiatr Bull.* (2007) 31:421–4. doi: 10.1192/pb.bp.107.014803
5. Priebe S, Badesconyi A, Fioritti A, Hansson L, Kilian R, Torres-Gonzales F, et al. Reinstitutionalisation in mental health care: comparison of data on service provision from six European countries. *BMJ.* (2005) 330:123–6. doi: 10.1136/bmj.38296.611215.AE
6. Hudson CG. Deinstitutionalization of mental hospitals and rates of psychiatric disability: an international study. *Health Place.* (2019) 56:70–9. doi: 10.1016/j.healthplace.2019.01.006
7. Winkler P, Barrett B, McCrone P, Csémy L, Janoušková M, Höschl C. Deinstitutionalised patients, homelessness and imprisonment: systematic review. *Br J Psychiatry.* (2016) 208:421–8. doi: 10.1192/bjp.bp.114.161943
8. Priebe S, Frottier P, Gaddini A, Kilian R, Lauber C, Martínez-Leal R, et al. Mental health care institutions in nine European countries, 2002 to 2006. *Psychiatr Serv.* (2008) 59:570–3. doi: 10.1176/ps.2008.59.5.570
9. Sisti DA, Segal AG, Emanuel EJ. Improving long-term psychiatric care: bring back the asylum. *JAMA.* (2015) 313:243–4. doi: 10.1001/jama.2014.16088
10. Wolf A, Whiting D, Fazel S. Violence prevention in psychiatry: an umbrella review of interventions in general and forensic psychiatry. *J Forens Psychiatry Psychol.* (2017) 28:659–73. doi: 10.1080/14789949.2017.1284886
11. Bulten E, Verkes RJ. Long stay in Europe: a systems-oriented approach. In: Völlm B, Braun P, editors. *Long-Term Forensic Psychiatric Care. Clinical,*

Ethical and Legal Challenges. Switzerland: Springer International Publishing (2019). p. 27–45.
12. Nedopil N. The role of forensic psychiatry in mental health systems in Europe. *Crim Behav Ment Health.* (2009) 19:224–34. doi: 10.1002/cbm.719
13. Seppänen A, Joelsson P, Ahlgren-Rimpiläinen A, Repo-Tiihonen E. Forensic psychiatry in Finland: an overview of past, present and future. *Int J Ment Health Syst*. (2020) 14:29. doi: 10.1186/s13033-020-00362-x
14. Niveau G, Welle I. Forensic psychiatry, one subspecialty with two ethics? *A systematic review BMC Medical Ethics.* (2018) 19:25. doi: 10.1186/s12910-018-0266-5
15. Royal College of Psychiatrists. *Your Guide to Relational Security. See Think Act. Centre for Quality Improvement*. London: Quality Network for Forensic Mental Health Services (2015). Available online at: http://www.bcmhsus.ca/Documents/see_think_act_document.pdf (accessed October 12, 2021).
16. Chester V, Alexander RT, Morgan W. Measuring relational security in forensic mental health services. *BJPsych Bulletin.* (2017) 41:358–63. doi: 10.1192/pb.bp.116.055509
17. Ferrito M, Vetere A, Adshead G, Moore E. Life after homicide: accounts of recovery and redemption of offender patients in a high security hospital – a qualitative study. *J Forens Psychiatry Psychol.* (2012) 23:327–44. doi: 10.1080/14789949.2012.668211
18. Hörberg U, Sjögren R, Dahlberg K. To be strategically struggling against resignation: The lived experience of being cared for in forensic psychiatric care. *Issues Ment Health Nurs.* (2012) 33:743–51. doi: 10.3109/01612840.2012.704623
19. Kennedy HG, Simpson A, Haque Q. Perspective on excellence in forensic mental health services; what we can learn from oncology and other medical services. *Front Psychiatry*. (2019) 10:733. doi: 10.3389/fpsyt.2019.00733
20. Kennedy HG. Models of care in forensic psychiatry. *BJPsych Advances.* (2022) 28:46–59. doi: 10.1192/bja.2021.34
21. Finnish Ministry of Social Affairs and Health. *Consolidation of the Penal Code and the Mental Health Act. Provisions on criminal patients*. (2005). Available online at: https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/71934/TRM200520.pdf?sequence=1&isAllowed=y (accessed October 31, 2021).
22. Dressing H, Salize HJ. Forensic psychiatric assessment in European Union member states. *Acta Psychiatr Scand.* (2006) 114:282–9. doi: 10.1111/j.1600-0447.2006.00771.x
23. Edworthy R, Sampson S, Völlm B. Inpatient forensic psychiatric care: legal frameworks and service provision in three European countries. *Int J Law Psychiatry.* (2016) 47:18–27. doi: 10.1016/j.ijlp.2016.02.027
24. Nedopil N, Taylor P, Gunn J. Forensic psychiatry in Europe: the perspective of Ghent Group. *Int J Psychiatry Clin Pract.* (2015) 19:80–3. doi: 10.3109/13651501.2014.967700
25. Wild G, Alder R, Weich S, McKinnon I, Keown P. The Penrose hypothesis in the second half of the 20th century: investigating the relationship between psychiatric bed numbers and the prison population in England between 1960 and 2018-2019. *Br J Psychiatry.* (2022) 220:295–301. doi: 10.1192/bjp.2021.138
26. Tomlin J, Lega I, Braun P, Kennedy HG, Herrando VT, Barroso R, et al. Forensic mental health in Europe: some key figures. *Soc Psychiatry Psychiatr Epidemiol.* (2021) 56:109–17. doi: 10.1007/s00127-020-01909-6
27. Degl' Innocenti A, Alexiou E, Andiné P, Striskaite J, Nilsson T. A register-based comparison study of Swedish patients in forensic psychiatric care 2010 and 2018. *Int J Law Psychiatry*. (2021) 77:101715. doi: 10.1016/j.ijlp.2021.101715
28. Finnish Ministry of Social Affairs and Health. *Plan for Mental Health and Substance Abuse Work. Proposals of the Mieli 2009 Working Group to Develop Mental Health and Substance Abuse Work Until 2015*. (2010). Available online at: https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/74086/URN%3aNBN%3afi-fe201504225273.pdf?sequence=1&isAllowed=y (accessed November 1, 2021).
29. Finnish Ministry of Social Affairs and Health. National Mental Health Strategy and Programme for Suicide Prevention 2020–2030 (2020). Available online at: https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/162234/STM_2020_15.pdf (accessed November 1, 2021).
30. Kuosmanen A, Tiihonen J, Repo-Tiihonen E, Eronen M, Turunen H. Patient safety culture in two Finnish state-run forensic psychiatric hospitals. *J Forensic Nurs.* (2013) 9:207–16. doi: 10.1097/JFN.0b013e318281068c
31. Tuovinen S. *Reduction of Seclusion and Restraint and Hospital Violence During Involuntary Forensic Psychiatric Care*. Dissertations in Health Sciences 446 Kuopio: University of Eastern Finland. (2017).
32. Sampson S, Edworthy R, Völlm B, Bulten E. Long-Term Forensic Mental Health Services: an exploratory comparison of 18 European Countries. *Int J Forensic Ment Health.* (2016) 15:333–51. doi: 10.1080/14999013.2016.1221484
33. Finnish Institute for Health and Welfare. *Data from: Tietokantaraportit Psykiatrinen erikoissairaanhoito palveluntuottajittain*. (2019). Available online at: https://thl.fi/fi/tilastot-ja-data/tilastot-aiheittain/tietokantaraportit#Erkoissairaanhoidon%20palvelut
34. Finnish Institute for Health and Welfare. *Data from: Oikeuspsykiatristen asioiden lautakunnassa käsitellyt asiat 2011–2020*. (2021). Available online at: https://thl.fi/documents/974282/1449788/THL$+$oikeuspsykiatria$+$tilasto$+$2011--2020.pdf/9a7afdfb-4ae3--406e-ba21--1d1f0527376f?t=1611840213762
35. Royal College of Psychiatrists. *Standards for Medium Secure Services,* vol. 178. London: Quality Network for Forensic Mental Health Services (2014). 50 p.
36. UK Department of Health. *High secure building design guide: overarching principles for Ashworth, Broadmoor, Rampton Hospitals*. London: Department of Health Publications (2010). Available online at: https://www.gov.uk/government/publications/high-secure-building-design-guide-overarching-principles-for-ashworth-broadmoor-rampton-hospitals (Accessed November 5, 2021).
37. UK Department of Health. *Environmental design guide: Adult medium secure services*. London: Department of Health Publications (2011). Available online at: https://www.gov.uk/government/publications/environmental-design-guide-adult-medium-secure-services (accessed November 5, 2021).
38. Hirsjärvi S, Hurme H. *Tutkimushaastattelu. Teemahaastattelun ja teorian käytäntö*. Helsinki: Gaudeamus (2018). 213 p.
39. Kankkunen P, *Vehviläinen-Julkunen K. Tutkimus hoitotieteessä*. Helsinki: SanomaPro (2013). 264 p.
40. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* (2006) 3:77–101. doi: 10.1191/1478088706qp063oa
41. Herzog C, Handke C, Hitters E. Analyzing talk and text II: thematic analysis. In: Van den Bulck H, Puppis M, Donders K, Van Audenhove L, editors. *The Palgrave Handbook of Methods for Media Policy Research*. Palgrave Macmillan: Basingstoke (2019). p. 385–401.
42. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: implications for conducting a qualitative descriptive study. *Nurs Health Sci.* (2013) 15:398–405. doi: 10.1111/nhs.12048
43. Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: striving to meet the trustworthiness criteria. *Int J Qual Methods.* (2017) 16:1–13. doi: 10.1177/1609406917733847
44. Braun V, Clarke V. One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qual Res Psychol.* (2021) 18:328–52. doi: 10.1080/14780887.2020.1769238
45. Shepherd A, Doyle M, Sanders C, Shaw J. Personal recovery within forensic settings – Systematic review and meta-synthesis of qualitative studies. *Crim Behav Ment Health.* (2016) 26:59–75. doi: 10.1002/cbm.1966
46. Hodgins S, Müller-Isberner R. Preventing crime by people with schizophrenic disorders: the role of psychiatric services. *Br J Psychiatry.* (2004) 185:245–50. doi: 10.1192/bjp.185.3.245
47. Hodgins S, Müller-Isberner R, Tiihonen J, Repo-Tiihonen E, Eronen M, Eaves D, et al. A comparison of general adult and forensic patients with schizophrenia living in the community. *Int J Forensic Ment Health.* (2007) 6:63–75. doi: 10.1080/14999013.2007.10471250
48. Kivimies K, Repo-Tiihonen E, Tiihonen J. The substance use among forensic psychiatric patients. *Am J Drug Alcohol Abuse.* (2012) 38:273–7. doi: 10.3109/00952990.2011.643972
49. Hodgins S, Tiihonen J, Ross D. The consequences of Conduct Disorder for males who develop schizophrenia: associations with criminality, aggressive behavior, substance use, and psychiatric services. *Schizophr Res.* (2005) 78:323–35. doi: 10.1016/j.schres.2005.05.021
50. Khosla V, Davison P, Gordon H, Verghese J. The interface between general and forensic psychiatry: the present day. *BJPsych Adv.* (2014) 20:359–65. doi: 10.1192/apt.bp.109.007336

51. Hodgins S. Could expanding and investing in first-episode psychosis services prevent aggressive behaviour and violent crime? *Front Psychiatry.* (2022) 13:821760. doi: 10.3389/fpsyt.2022.821760
52. Probst T, Bezzel A, Hochstadt M, Pieh C, Mache W. Criminal recidivism after forensic psychiatric treatment. A multicenter study on the role of pretreatment, treatment-related, and follow-up variables. *J Forensic Sci.* (2020) 65:1221–4. doi: 10.1111/1556-4029.14281
53. Coid JW, Kallis C, Doyle M, Shaw J, Ullrich S. Identifying causal risk factors for violence among discharged patients. *PLoS ONE.* (2015) 10:e0142493. doi: 10.1371/journal.pone.0142493
54. Simpson AIF, Penney SR. The recovery paradigm in forensic mental health services (editorial). *Crim Behav Ment Health.* (2011) 21:299–306. doi: 10.1002/cbm.823
55. Senneseth M, Pollak C, Urheim R, Logan C, Palmstierna T. Personal recovery and its challenges in forensic mental health: systematic review and thematic synthesis of the qualitative literature. *BJPsych Open.* (2021) 8:e17. doi: 10.1192/bjo.2021.1068
56. Walravens T, Bierbooms J, Horst PT. Recovery and strength-based practice in long-term forensic psychiatry. In: Völlm B, Braun P, editors. *Long-Term Forensic Psychiatric Care. Clinical, Ethical And Legal Challenges*. Switzerland: Springer International Publishing (2019). p. 81–102.
57. Tapp J, Warren F, Fife-Schaw C, Perkins D, Moore E. What do the experts by experience tell us about 'what works' in high secure forensic inpatient hospital services? *J Forens Psychiatry Psychol.* (2013) 24:160–78. doi: 10.1080/14789949.2012.760642
58. Schoppmann S, Balensiefen J, Lau S, Graf M, Hachtel H. Patients' views with regard to personal recovery in forensic psychiatry in German-speaking Switzerland – An explorative study. *Front Psychiatry.* (2021) 12:695096. doi: 10.3389/fpsyt.2021.695096
59. Talbot EC, Völlm B, Khalifa N. Effectiveness of work skills programmes for offenders with mental disorders: a systematic review. *Crim behav Mental Health.* (2015) 27:40–58. doi: 10.1002/cbm.1981
60. Livingstone JD. What does success look like in the forensic mental health system? Perspectives of service users and service providers. *Int J Offender Ther Comp Criminol.* (2018) 62:208–28. doi: 10.1177/0306624X16639973
61. Markham S. See think act: the need to rethink and refocus on relational security. *J Forens Psychiatry Psychol.* (2022) 33:200–30. doi: 10.1080/14789949.2022.2044068
62. Salisbury TT, Killaspy H, King M. An international comparison of the deinstitutionalisation of mental health care: Development and findings of the Mental Health Services Deinstitutionalisation Measure (MENDit). *BMC Psychiatry.* (2016) 16:54. doi: 10.1186/s12888-016-0762-4
63. Sadeniemi M, Almeda N, Salinas-Pérez JA. Gutiérrez-Colosia Mr, García-Alonso C, Ala-Nikkola T, et al. A comparison of mental health care systems in Northern and Southern Europe: A service mapping study. *Int J Environ Res Public Health.* (2018) 15:1133. doi: 10.3390/ijerph15061133
64. O'Brien A, Fahmy R, Singh SP. Disengagement from mental health services. A literature review. *Soc Psychiatry Psychiatr Epidemiol.* (2009) 44:558–68. doi: 10.1007/s00127-008-0476-0
65. Askola R, Soininen P, Seppänen A. Offense-related issues in forensic psychiatric treatment: a thematic analysis. *Front Psychiatry.* (2020) 10:925. doi: 10.3389/fpsyt.2019.00925
66. De Page L, Titeca P. Patients are changing – the ripple effects of changing the law and creating new forensic beds in Belgium. *Int J Law Psychiatry.* (2021) 76:101684. doi: 10.1016/j.ijlp.2021.101684
67. Chow WS, Ajaz A, Priebe S. What drives changes in institutionalized mental health care? A qualitative study of the perspectives of professional experts. *Soc Psychiatry Psychiatr Epidemiol.* (2019) 54:737–44. doi: 10.1007/s00127-018-1634-7
68. O'Neill C, Sinclair H, Kelly A, Kennedy H. Interaction of forensic and general psychiatric services in Ireland: learning the lessons or repeating the mistakes? *Ir J Psychol Med.* (2014) 19:48–54. doi: 10.1017/S0790966700006959
69. Tomlin J, Bartlett P, Völlm B. Experiences of restrictiveness in forensic psychiatric care: systematic review and concept analysis. *Int J Law Psychiatry.* (2018) 57:31–41. doi: 10.1016/j.ijlp.2017.12.006
70. Kennedy HG. Therapeutic uses of security: mapping forensic mental health services by stratifying risk. *BJPsych Advances.* (2002) 8:433–43. doi: 10.1192/apt.8.6.433
71. Papalia N, Spivak B, Daffern M, Ogloff JRP, A. meta-analytic review of the efficacy of psychological treatments for violent offenders in correctional and forensic mental health settings. *Clin Psychol Sci Pract.* (2019) 26:e12282. doi: 10.1111/cpsp.12282
72. DeMatteo D, Haney-Caron E, Flack D. The next step forward in determining "What Works". Commentary (invited). *Clin Psychol Sci Pract.* (2019) 26:e12285. doi: 10.1111/cpsp.12285
73. Seppänen A, Törmänen I, Shaw C, Kennedy H. Modern forensic psychiatric hospital design: clinical, legal and structural aspects. *Int J Ment Health Syst.* (2018) 12:58. doi: 10.1186/s13033-018-0238-7
74. Royal College of Psychiatrists. *Standards for Forensic Mental Health Services: Low and medium secure care*. 4th Edition. London: Quality Network for Forensic Mental Health Services. (2021).
75. Department of Health and Social Care. *Guidance on the High Security Psychiatric Services (Arrangements for Safety and Security) Directions*. (2019). Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810693/guidance-on-the-high-security-psychiatric-services-directions-2019.pdf (accessed December 1, 2021).
76. Royal College of Psychiatrists. *Standards for Community Forensic Mental Health Services*. London: Quality network for forensic mental health services. (2013). Available online at: http://www.antoniocasella.eu/archipsy/KENNEY-HERBERT_APR13.pdf (accessed December 1, 2021).

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers | Frontiers in Psychiatry

ORIGINAL RESEARCH
published: 15 July 2022
doi: 10.3389/fpsyt.2022.907123

Gender Differences in the Psychopharmacological Treatment of Forensic In-Patients With Schizophrenia

Juliane Mayer[1], Nenad Vasic[2], Viviane Wolf[1,3], Ivonne Steiner[1], Verena Klein[1], Michael Fritz[4,5], Philipp Rothe[1,6], Judith Streb[4] and Manuela Dudeck[4]*

[1] Department of Forensic Psychiatry and Psychotherapy, kbo-Isar-Amper-Clinic Taufkirchen (Vils), Taufkirchen, Germany, [2] Clinic for Psychiatry and Psychotherapy, Clinic Centre Christophsbad, Göppingen, Germany, [3] Department of Psychiatry and Psychotherapy, Medical Faculty, LVR-Clinic Düsseldorf, Heinrich Heine University Düsseldorf, Düsseldorf, Germany, [4] Department of Forensic Psychiatry and Psychotherapy, District Hospital Günzburg, Ulm University, Günzburg, Germany, [5] School of Health and Social Sciences, AKAD University of Applied Sciences, Stuttgart, Germany, [6] kbo-Lech-Mangfall-Clinic Agatharied, Hausham, Germany

Background: In forensic psychiatry, psychopharmacological treatment plays a crucial role for patients with schizophrenia in improving their medical as well as legal prognosis. However, an increase in the number of females entering forensic treatment has yet to yield empirical research on the outcome of psychopharmacological treatment of female patients with schizophrenia in terms of efficacy and tolerability.

Aims: The aim of the present study is to elucidate pharmacological treatment strategies of women with schizophrenia in forensic psychiatry in comparison with men.

Methods: This study compares psychopharmacological treatment strategies, psychopathological features, as well as neurological and metabolic side effects of treatment between 29 female and 29 male in-patients with schizophrenia in three forensic facilities in Bavaria, Germany.

Results: Results show significant differences between genders. Poorer psychopathological and neurological features were found in the female sample, while men registered worse metabolic parameters. In terms of psychopharmacological treatment strategies, female in-patients were more often prescribed second-generation depot antipsychotics. Surprisingly, the potency of the dosages did not differ between genders. The results suggest that female forensic patients with schizophrenia have more severe and refractory diseases than their male counterparts.

Conclusion: Recommendations for gender-specific treatment strategies are derived.

Keywords: gender differences, schizophrenia, psychopharmacotherapy, antipsychotics, female offenders, forensic psychiatry

OPEN ACCESS

Edited by:
Owen Price,
The University of Manchester, United Kingdom

Reviewed by:
Mary V. Seeman,
University of Toronto, Canada
Eugenio Aguglia,
University of Catania, Italy

****Correspondence:***
Juliane Mayer
juliane.mayer@kbo.de

Specialty section:
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

Received: *29 March 2022*
Accepted: *21 June 2022*
Published: *15 July 2022*

Citation:
Mayer J, Vasic N, Wolf V, Steiner I, Klein V, Fritz M, Rothe P, Streb J and Dudeck M (2022) Gender Differences in the Psychopharmacological Treatment of Forensic In-Patients With Schizophrenia. Front. Psychiatry 13:907123. doi: 10.3389/fpsyt.2022.907123

INTRODUCTION

Schizophrenia is one of the most severe, diverse, and detrimental psychiatric disorders, accompanied by major psychological, social, and cognitive impairments. Treatment guidelines consistently recommend the administration of antipsychotic medication as a fundamental component of a multimodal treatment framework (1). Since currently available antipsychotics

differ in their efficacy and tolerability (2), clinicians are advised to not only consider the ability of the particular antipsychotic and dosage to reduce individual negative and positive schizophrenic symptoms in order to improve psychopathological features (3), but to also take into account the typical adverse side effects profile of the drug to avoid or reduce their occurrence. In particular, neurological and metabolic side effects appear to be the best studied and documented when it comes to antipsychotic medication (4).

Ensuring effective antipsychotic treatment for patients with schizophrenia is of particular importance with regard to forensic psychiatry. While schizophrenia patients have an increased risk of delinquency and violent behavior compared to the general population (5), psychopharmacological treatment is not only focused on the remittance of symptoms, but also the reduction of aggressive and criminal behavior in order to improve legal prognosis.

Evidence regarding psychopharmacological treatment strategies for schizophrenia in forensic settings is rare, focusing mainly on differences between general psychiatric and forensic samples (6, 7). Vasic et al. (8) not only examined the prescribed medication, but also the respective psychopathological status as well as neurological and metabolic side effects of in-patients with schizophrenia in either forensic (n = 29) or general psychiatry (n = 31) in two southern German clinics. They found that forensic patients received dosages of higher neuroleptic potency, albeit fewer psychopharmaceuticals. While there were no significant differences for neurological impairments or metabolic side effects, forensic patients exhibited more pronounced psychopathological features of delusions of grandeur, animosity, flattening of affect, week will, social passivity, apathy, uncooperative behavior, and poor impulse control, indicating that paranoid and negative symptoms predominate in the forensic patients.

Previous research on psychopharmacological treatment of forensic patients with schizophrenia has mainly been focused on male subjects. With the actual rate of delinquent behavior among schizophrenia patients amounting to 13.5% (9), men (10.7%) are significantly more affected than women (2.7%) (10). However, an increase in the number of females hospitalized in forensic psychiatry has been observed in many countries, urging the need for evidence-based research on gender-specific treatment strategies for female forensic patients (11). To our knowledge, only one study directly compares treatment characteristics of male and female forensic patients with schizophrenia. Günther et al. (12) used a latent class analysis with 31 women and 329 men to show that the female-dominated class was equally likely to receive high antipsychotic dosages and was less likely to benefit from in-patient forensic treatment. Alas, they did not further elaborate on the specific psychopharmacological treatment strategies or examine possible side effects of the medication. However, previous research in non-forensic settings reported significant gender differences in schizophrenia patients not only regarding clinical, social, and illness course characteristics, but also the prescription of antipsychotic medication. In general, women were found to show a superior response rate to antipsychotic medication, to need lower doses, especially pre-menopause, and to exhibit better social functioning and outcome, while man were prone to more substance abuse (13–15). Regarding metabolic and neurological side effects, women have shown to be at greater risk for metabolic complications (13, 16) and are generally more frequently affected by extrapyramidal side effects than men (17). When it comes to forensic samples, however, gender differences in psychopathology, especially concerning proneness for violent behavior, seem to diminish (12), suggesting that female forensic patients with schizophrenia are quite similar to their male counterparts in that respect.

The aim of this exploratory study is to elucidate pharmacological treatment strategies of women with schizophrenia in forensic psychiatry in comparison with men. In order to better understand gender-specific treatment needs and practice of the understudied subgroup of female offenders with schizophrenia, we are especially interested in uncovering potential gender differences in the relationships between the targeted psychopathological symptoms and drug therapy as well as in the occurrence of side effects. Therefore, we expand the research design by Vasic et al. (8) to include a female forensic sample. Particularly, we aim to examine gender differences between the male forensic sample previously studied by Vasic et al. (8) and a corresponding female forensic sample pertaining to medication and dosage, psychopathological status, as well as neurological and metabolic side effects to be able to assess pharmacological treatment strategies in terms of both their efficacy and tolerability and, ultimately, improve gender-specific treatment of female forensic patients with schizophrenia.

MATERIALS AND METHODS

Participants

We studied 29 female forensic in-patients being treated in the Department for Forensic Psychiatry and Psychotherapy of the kbo-Isar-Amper-Klinikum Taufkirchen (Vils), Germany, and 29 male forensic in-patients being treated in the Department of Forensic Psychiatry and Psychotherapy at the District Hospital Günzburg, Germany, and in the Department for Forensic Psychiatry and Psychotherapy at the District Hospital Kaufbeuren, Germany [see also Vasic et al. (8)]. All participants were clinically diagnosed with a schizophrenia spectrum disorder (F2) according to ICD-10. The female patients were recruited between November 2018 and May 2019 on a total of five both closed and open wards. The male patients were recruited July 2014 through October 2014 on a total of four wards. Most patients were hospitalized under the terms of a hospital treatment order according to Section 63 of the German Criminal Code, while eleven were court ordered to a provisional placement according to Section 126a of the German Code of Criminal Procedure and two patients were hospitalized under the terms of an addiction treatment according to Section 64 of the German Criminal Code. **Table 1** shows group characteristics.

Procedure

The project had been approved by the local ethics committee (Ulm University, Germany). Patients were informed about

TABLE 1 | Group characteristics of male and female in-patients with schizophrenia.

	Men (n = 29)	Women (n = 29)		
	M (SD)/ prevalence in %	M (SD)/ prevalence in %	U/χ^2	Significance level (p)
Age (years)	41.0 (9.3)	43.9 (12.4)	365.0[a]	0.388
Education level				
Education to end of 9th grade ("Hauptschule")	75.9%	44.8%	11.510[b]	0.021*
Education to end of 9th grade ("Realschule")	17.2%	27.6%		
Education to end of 12th or 13th grade ("Abitur") and higher education	6.9%	27.8%		
Age of onset (years)	27.3 (8.4)	28.5 (12.3)	397.5[a]	0.892
Duration of illness (years)	13.6 (6.2)	16.0 (11.1)	366.5[a]	0.528
Number of hospitalizations	7.9 (9.0)	7.5 (7.5)	413.0[a]	0.907
Body mass index	26.6 (7.1)	27.8 (6.4)	405.0[a]	0.987
Family status				
Single	89.7%	58.6%	10.284[b]	0.016*
Married	3.4%	10.3%		
Divorced/widowed	6.9%	31.0%		
Profession				
Untrained	37.9%	58.6%		
Trained worker	48.3%	17.2%	6.367[b]	0.041*
Employee	13.8%	24.1%		
Family psychiatric history				
Schizophrenia	50.0%	20.7%	8.996[b]	0.011*
Other psychiatric disorders	3.8%	31.0%		
Age at first imprisonment (years)	31.05 (9.7)	38.1 (12.0)	209.0[a]	0.036*
Offense characteristics				
Property offense	24.1%	3.4%	6.078[b]	0.014*
Traffic offense	13.8%	0.0%	4.811[b]	0.028*
Arson	6.9%	27.6%	3.881[b]	0.049*
Offense committed under the influence of a substance	6.9%	41.4%	8.199[b]	0.004**

M, mean; SD, standard deviation.
[a]*Mann–Whitney-U.*
[b]*Chi-square χ^2 (Pearson).*
*$p < 0.05$, **$p < 0.01$ (asymptotic, two-tailed).*

the study objectives and provided written informed consent, receiving neither financial nor non-financial compensation for their participation. Collection of data from patient files and completion of the questionnaires was conducted by experienced research assistants working in the institutions. Collection of laboratory data and physical examination was performed by clinicians who treated the particular patients.

Measures

The data was recorded using a self-designed data entry form. We examined patients in person as well as their medical files and official court records to collect the following data: age, gender, family status, education level, profession, main diagnosis and secondary diagnosis, age at first hospitalization, number of hospitalizations, suicidal acts and self-harm in medical history, mental disorders in the family history, past substance abuse, age at first imprisonment, age at first conviction, regulatory framework of the current hospitalization, duration of the current hospitalization, characteristics of the offense leading to the current hospitalization (violent offense, e.g., homicide/manslaughter, robbery, and assault; property offense; arson; sexual offense; traffic offense; drug-related offense; whether the offense was committed under the influence of a substance), as well as current medication including dosage and form of application. For the female sample, we also assessed menopausal status.

To evaluate the effectiveness of the antipsychotic medication, we assessed the current psychopathological status using the Positive and Negative Syndrome Scale (PANSS) (18) and the Brief Psychiatric Rating Scale (BPRS) (19). While the BPRS measures psychiatric symptoms like depression, anxiety, and psychotic symptoms in general, the PANSS specifically targets symptom severity of patients with schizophrenia. The diagnostic criteria for the deficit syndrome of schizophrenia (DSS) (20, 21) were used for a closer examination of the prevalence and severity of negative schizophrenic symptoms. Finally, the Global Assessment Scale (GAS) (22) was used to assess a patient's overall level of social and psychological functioning.

To account for possible side effects of the antipsychotic medication, we examined metabolic and neurological abnormalities. Thus, specific metabolic laboratory parameters, i.e., glycated hemoglobin (HBa1c), cholesterol, triglycerides, C-reactive protein (CRP), gamma-glutamyltransferase (GGT), and glutamic oxaloacetic transaminase (GOT), were retrieved. In addition, height and weight at time of admission and examination were recorded as well as waist and hip measurements were taken in order to calculate the body mass index (BMI) and waist-to-hip ratio to evaluate obesity-associated metabolic complications. Neurological side effects were examined using the Extrapyramidal Symptom Scale (EPS) (23) to rate extrapyramidal movement disorders, the Barnes Akathisia Scale (BAS) (24) to assess drug-induced restlessness, and the Abnormal Involuntary Movement Scale (AIMS) (25) describing dyskinesia associated with antipsychotic medication.

Data Analysis

Data analysis was performed with the Statistical Package for Social Sciences [SPSS Statistics for Windows; IBM Corp., (26)]. First, we calculated absolute and relative frequencies, mean values, and standard deviations separately for both genders. Since most variables did not meet conditions for normal distribution or variance homogeneity, group comparisons

were performed using the Mann–Whitney-*U* test, while the Pearson Chi-square (χ^2) independence test was used to compare frequencies.

RESULTS

Group Characteristics

A comparison of the male and female in-patients participating in this study (**Table 1**) revealed significant differences regarding their social situation, i.e., education level, profession, and family status. The women had a higher level of education overall and were more likely to have been married before hospitalization, while men were more likely to have completed their occupational training.

Regarding clinical characteristics, schizophrenia was significantly more prevalent in the family history of men, while women more often reported other mental illnesses in their families. However, age of onset, number of prior hospitalizations, and duration of illness did not differ between genders.

Differences were also found with regard to criminal aspects. Age at first imprisonment was significantly lower for men than for women. The distribution of the offenses leading to the hospitalization also showed significant differences. Women more frequently committed arson and were more frequently under the influence of substances during the act. Men, on the other hand, committed property and traffic offenses more frequently. The samples did not differ with regard to violent and sexual delinquency as well as drug-related crime.

Psychopathological Features

Table 2 depicts significant differences between genders in their psychopathological status as assessed with the measures applied in this study. Overall, a poorer psychopathological status was attributed to women compared to men. Women suffered more from general psychopathological symptoms such as concerns about somatic health, guilt, anxiety, and depression. They showed higher levels of suspiciousness and more often stereotyped thoughts as well as lack of judgment and insight. However, only differences in feelings of guilt as measured by the BPRS and PANSS persisted after Bonferroni correction.

With regard to the assessment of the DSS, negative symptoms shown in the female sample were more likely to be attributed to the effects of the medication. This difference also persisted after Bonferroni correction. No significant differences were found regarding the global assessment of the psychological and social functioning (GAS).

Neurological Characteristics

Significant group differences in neurological status were found in relation to AIMS, i.e., muscles of facial expression, lips and perioral area, current problems with teeth and/or dentures, as well as extrapyramidal disorders (EPS), i.e., glabella reflex (see **Table 3**), with women receiving higher ratings for their occurrence or severity. The group difference for muscles of facial expressions as measured by the AIMS persisted even after Bonferroni correction. The results indicate that women in forensic psychiatry with a diagnosis of schizophrenia are significantly more affected by impaired neurological functioning of the face and oral area than men. However, no gender differences were found for symptoms of akathisia (BAS).

TABLE 2 | Differences in the psychopathological features between male and female forensic in-patients with schizophrenia.

	Men (*n* = 29)	Women (*n* = 29)		
	M (SD)/ prevalence in %	*M* (SD)/ prevalence in %	U/χ^2	Significance level (*p*)
BPRS				
Somatic concern	2.0 (1.3)	3.1 (1.9)	288.5[a]	0.032*
Anxiety	1.8 (1.2)	3.3 (1.9)	231.0[a]	0.002**
Guilt	1.6 (1.1)	3.1 (1.9)	220.0[a]	0.001***
Total	37.7 (9.6)	43.7 (12.1)	312.5[a]	0.093
DSS				
Negative symptoms secondary to drug effects	42.9%	92.0%	14.222[b]	0.000***
GAS	5.03 (1.5)	4.55 (1.5)	337.0[a]	0.182
PANSS				
Suspiciousness (P6)	2.0 (1.1)	3.1 (1.7)	264.0[a]	0.012*
Stereotyped thinking (N7)	1.7 (0.8)	2.6 (1.1)	215.5[a]	0.001***
Anxiety (G2)	1.6 (0.8)	2.8 (1.9)	262.5[a]	0.009**
Guilt feelings (G3)	1.7 (1.2)	3.0 (1.7)	222.5[a]	0.001***
Depression (G6)	1.6 (0.7)	2.7 (1.6)	242.5[a]	0.004**
Lack of judgment and insight (G12)	2.5 (1.6)	3.5 (1.5)	266.0[a]	0.014*
Total general psychopathology scale (G)	30.3 (7.6)	38.2 (10.3)	230.5[a]	0.003**
Total	60.7 (16.9)	72.3 (20.1)	286.0[a]	0.036*

M, mean; SD, standard deviation; BPRS, Brief Psychiatric Rating Scale; DSS, diagnostic criteria for the deficit syndrome of schizophrenia; GAS, Global Assessment Scale; PANSS, Positive and Negative Syndrome Scale.
[a]*Mann–Whitney-U.*
[b]*Chi-square χ^2 (Pearson).*
**p < 0.05, **p < 0.01, ***p < 0.001 (asymptotic, two-tailed).*

Metabolic Parameters

Metabolic parameters showed significant differences between genders for blood serum lipids (see **Table 4**). Men had higher cholesterol and triglycerides levels than women. These differences were also evident when interpreting the levels according to reference intervals, with borderline or pathological levels for cholesterol and triglycerides being measured significantly more frequently for men than for women. After Bonferroni correction, differences still persisted for cholesterol levels as well as the reference interval for triglycerides. Other blood serum levels or measurements of metabolic parameters (e.g. waist size; change in BMI over time) showed no significant differences.

Psychopharmacological Treatment Strategies

With regard to the total number of drugs, psychopharmaceuticals, and depot preparations prescribed,

TABLE 3 | Differences in the neurological characteristics between male and female forensic in-patients with schizophrenia.

	Men (n = 29)	Women (n = 29)		
	M (SD)/ prevalence in %	M (SD)/ prevalence in %	U/χ^2	Significance level (p)
AIMS				
Muscles of facial expression	0.2 (0.5)	1.1 (1.2)	204.5[a]	0.000***
Lips and perioral area	0.6 (1.1)	1.1 (1.2)	285.5[a]	0.020*
Current problems with teeth and/or dentures	24.1%	58.6%	7.108[b]	0.008**
EPS				
Glabella reflex	1.1 (0.4)	1.5 (0.9)	265.0[a]	0.005**

M, mean; SD, standard deviation; AIMS, Abnormal Involuntary Movement Scale; EPS, Extrapyramidal Symptom Scale.
[a]*Mann–Whitney-U.*
[b]*Chi-square χ^2 (Pearson).*
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ (asymptotic, two-tailed).*

TABLE 4 | Differences in blood serum lipids between male and female forensic in-patients with schizophrenia.

	Men (n = 29)	Women (n = 29)		
	M (SD)/ prevalence in %	M (SD)/ prevalence in %	U/χ^2	Significance level (p)
Cholesterol (mg/dl)	221.5 (43.5)	188.6 (38.7)	131.5[a]	0.004**
Cholesterol reference interval				
Normal	35.0%	75.0%	7.886[b]	0.019*
Borderline	5.0%	3.6%		
Pathological	60.0%	21.4%		
Triglycerides (mg/dl)	254.8 (202.9)	119.1 (62.7)	142.0[a]	0.004**
Triglycerides reference interval				
Normal	40.0%	89.3%	13.367[b]	0.001**
Borderline	5.0%	0.0%		
Pathological	45.0%	10.7%		

M, mean; SD, standard deviation.
[a]*Mann–Whitney-U.*
[b]*Chi-square χ^2 (Pearson).*
*$p < 0.05$, **$p < 0.01$ (asymptotic, two-tailed).*

TABLE 5 | Prescription rates of psychopharmaceuticals in male and female forensic in-patients with schizophrenia, separated into first-generation antipsychotics (FGAs) and second-generation antipsychotics (SGAs) as well as oral and depot preparations.

	Men (n = 29)	Women (n = 29)		
	M (SD)/ prevalence in %	M (SD)/ prevalence in %	U/χ^2	Significance level (p)
Chlorpromazine/ olanzapine equivalents (oral and depot)	587.0 (305.3)/19.6 (10.2)	580.4 (267.7)/19.3 (8.9)	411.0[a]	0.882
Drugs total			7.506[b]	0.585
1–2	51.7%	34.5%		
3–4	34.5%	44.8%		
>4	13.8%	20.7%		
Psychopharmaceuticals total			1.303[b]	0.861
1–2	62.1%	62.1%		
3–4	34.5%	34.5%		
>4	3.4%	3.4%		
FGAs total			0.167[b]	0.920
0	69.0%	72.4%		
1	17.2%	17.2%		
>1	13.8%	10.2%		
FGAs oral			2.791[b]	0.248
0	75.9%	86.2%		
1	24.1%	10.3%		
>1	0.0%	3.4%		
FGAs depot	20.7%	20.7%	0.000[b]	1.000
SGAs total			2.044[b]	0.563
0	10.3%	10.3%		
1	55.2%	69.0%		
>1	34.5%	20.7%		
SGAs oral			4.889[b]	0.180
0	20.7%	44.8%		
1	55.2%	44.8%		
>1	24.1%	10.4%		
SGAs depot	13.8%	44.8%	6.740[b]	0.009**
Depot total	34.5%	62.0%	4.948[b]	0.084

M, mean; SD, standard deviation; FGAs, first-generation antipsychotics; SGAs, second-generation antipsychotics.
[a]*Mann–Whitney-U.*
[b]*Chi-square χ^2 (Pearson).*
**$p < 0.01$ (asymptotic, two-tailed).*

there were no significant differences between men and women (see **Table 5**). The same applies to the total number of antipsychotics, benzodiazepines, antidepressants, and anticonvulsants. Significant differences in prescription rates for first-generation (FGA) or second-generation antipsychotics (SGA) were only found for SGA depot preparations, which were significantly more frequently prescribed to women. Comparing chlorpromazine and olanzapine equivalents (27) revealed no differences in the neuroleptic potency of the prescribed antipsychotic drugs between genders. On average, women received dosages of the same potency as men. In the female sample, no significant correlation for the menopausal status and the potency of the dosages was found (r = 0.073, p = 0.721).

Particularly, the differences in the prescription rates of SGA depot preparations could be mainly attributed to significantly higher prescription rates of aripiprazole depot in women, which was not prescribed to men at all (see **Table 6**). On the other hand, men were significantly more frequently prescribed clozapine as an orally administered SGA. With regard to antidepressants, only venlafaxine had significantly higher prescription rates in men. However, none of these differences persisted after Bonferroni

TABLE 6 | Prescription rates of drugs frequently prescribed in male and female in-patients with schizophrenia.

	Men (n = 29)	Women (n = 29)		
	Prevalence in %	Prevalence in %	χ^2	Significance level (p)
Antidepressants				
Venlafaxine	13.8%	0.0%	4.296	0.038*
Second-generation antipsychotics				
Clozapine	20.7%	3.4%	4.062	0.044*
Aripiprazole depot	0.0%	24.1%	7.961	0.005**

χ^2, *Chi-square (Pearson).*
*$p < 0.05$, **$p < 0.01$ *(asymptotic, two-tailed).*

correction, so these results should be interpreted cautiously. No significant differences could be found for other specific antipsychotics, benzodiazepines, or anticonvulsants.

DISCUSSION

This study, for the first time, examined gender differences in the psychopharmacological treatment of forensic in-patients with schizophrenia. For this purpose, 29 female patients with schizophrenic disorders being treated in forensic psychiatry were compared with respective 29 male patients regarding demographic, clinical, and criminal data, psychopharmacological treatment strategies, psychopathological characteristics, as well as neurological and metabolic side effects.

The study was able to show that women with schizophrenia in forensic psychiatry differ from men in terms of sociodemographic characteristics quite remarkably, in that they have a higher level of education overall and are more likely to having entered into marriage prior to hospitalization. This corresponds not only with research on general psychiatric patients with schizophrenia (14), but also with results of a Swiss study on gender-specific differences in forensic patients with a schizophrenic disorder (12). Moreover, we were able confirm the finding that women treated in forensic psychiatry were more often separated from their spouses or divorced, which also was described earlier for female offenders with mental illnesses (28). In accordance with Günther et al. (12), we therefore argue that more attention should be paid to the ability to maintain relationships when treating female offenders with schizophrenia.

An interesting result of the present study is that men were more likely to have completed their occupational training, while women had an overall higher level of education. Since the onset of the disorder, objectified by the age at first hospitalization, showed no gender differences in contrast to previous studies with general psychiatric (14) as well as forensic samples (12), it can be assumed that the sampled women in this study experienced the onset of the disorder before graduating from college or university, leading to the typical sudden drop in social functioning and performance often accompanying schizophrenia onset (29), while men were able to complete occupational training on a lower educational level before falling ill. Thus, the integration in a fitting occupational setting as a treatment goal can be more challenging for women, which should carefully be considered when planning treatment or discharge.

Further discrepancies to earlier studies also arise from the fact that our forensic samples did not differ with regard to clinical characteristics such as number of prior hospitalizations, duration of illness, past substance abuse, and comorbidities. While women usually have more comorbid disorders (16), men experience longer durations of illness and more frequent hospitalizations (12, 14). In addition, prior studies in general psychiatric (13) as well as forensic (12) contexts showed men to be more likely to abuse alcohol and other substances. In line with Günther et al. (12), however, no differences could be found in the present study with regard to suicidality, self-harm, and a comorbid diagnosis of a personality disorder. In summary, our results suggest that female schizophrenia in-patients in forensic psychiatry are quite similar to men when it comes to clinical characteristics, with one exception: men reported schizophrenia in their family history more often than women. While information on family histories in forensic settings is still scarce (8), our findings support recent evidence for an increased family burden of mental illness among men with schizophrenia treated in forensic psychiatry (30).

Regarding criminal aspects, our findings correspond with previous research in that women were older when first incarcerated (12), committed arson more frequently (31), and engaged in fewer property and traffic offenses than men (12). Interestingly, women more often were found to be under the influence of a substance when committing the offense leading to hospitalization, supporting previous studies with mentally ill female offenders (28). Contrary to Günther et al. (12), as well as Wang et al. (30), the prevalence of violent offenses did not differ between genders. However, it must be noted that we rated all acts of violence as violent offenses, while Wang et al. (30) as well as Günther et al. (12) specifically analyzed gender differences with respect to capital offenses. Thus, as our findings are preliminary and need to be confirmed, we recommend a more detailed analysis of different violent offenses in more comprehensive studies in the future.

Concerning psychopharmacological treatment strategies, we found no differences between men and women for the potency of the prescribed doses, confirming previous findings in a forensic setting (12). However, lower doses are usually recommended for women due to differences in absorption and metabolism (16). Moreover, Bauer and Knörnschild (17) point out that dosage regimen should consider changes in estrogen levels and be adjusted according to the individual menopausal status, with young premenopausal women requiring lower doses and postmenopausal women requiring higher doses. However, we could not find differences in the potency of the dosages when stratifying for menopause in our female sample, suggesting a possible disregard for gender-specific dosage recommendations in clinical practice. In light of our results, we propose a more nuanced approach to the dosage of antipsychotic medication according to menopausal status. Referring to the neuroprotective effects of additional treatment with estrogen,

especially in the case of very severe disease progression after menopause (17), Günther et al. (12) accordingly argue for lower doses for women in forensic treatment as standard doses are associated with overdoses and consequently with more side effects. Concerning neurological side effects, we indeed found more pronounced neurological impairments in the face and oral area in women, indicating possible overdosage. The fact that we found negative symptoms secondary to drug effects more pronounced in women could be interpreted as further evidence to that effect. However, it should be noted that women are generally more frequently affected by extrapyramidal side effects than men (17). Differences in the prescription rates of specific antipsychotics were found with regard to the more frequent use of clozapine in men and depot SGAs, primarily aripiprazole depot, in women. However, the latter may also be due to the fact that the depot formulation has not been approved in Germany until November 2013 (32), while data collection for men took place in 2014, making it a way more established antipsychotic when the female sample was surveyed in 2018 and 2019.

Differences in the metabolic side effects were found with regard to higher lipid levels in men. In line with Pillinger et al. (33), higher lipid levels could also be associated with more frequent use of clozapine, especially since Vasic et al. (8) found both significantly higher clozapine prescription rates and a trend for higher cholesterol levels in the forensic sample. Lower clozapine prescription rates in women found in this study could also be attributed to the more pronounced metabolic side effects of clozapine for women in general (13, 17, 34), making it an antipsychotic indicated for women in singular cases of treatment resistance.

Compared to men, women showed significantly worse psychopathological characteristics exhibiting more pronounced or less remitted symptoms than men, especially concerning their general psychopathology. While these findings contradict previous research in non-forensic settings (14), Günther et al. (12) also showed that women benefit less from in-patient forensic treatment than men when it comes to reducing psychopathological symptoms. Moreover, Tang et al. (15) also showed in a Chinese sample more severe and persistent positive and affective symptoms in women with schizophrenia. In contrast to previous findings (12, 14, 15) no gender differences in the onset of schizophrenia were found in this study, indicating a relatively early onset compared to other female samples. Earlier onset of schizophrenia usually means a more severe course of illness with long-lasting symptoms being relatively non-responsive to antipsychotic medication (16), which might provide an explanation as to why women showed worse psychopathology than men in this study. Since the treatment goal in forensic psychiatry pertains to the prevention of future delinquency through remission of psychopathology (7), a future research project could examine the influence of gender differences in the remission of psychopathological symptoms on delinquent recidivism. Moreover, women did not only show a worse response rate for single positive and negative symptoms, but also seemed to experience more pronounced feelings of guilt, anxiety, somatic discomfort, and depression, as well as less cognitive flexibility compared to men, indicating that female forensic patients with schizophrenia need more comprehensive treatment strategies and goals beyond the reduction of negative and positive symptoms. This is reflected in substantiated findings that women with schizophrenia (35) as well as female offenders with severe mental disorders (36) report more traumatic experiences then men and tend to act against their close family members (30). Landgraf et al. (37) showed in a pioneer study on clinical and demographic differences between forensic (n = 35) and general psychiatric (n = 35) female patients with schizophrenia that criminal behavior is associated with greater clinical impairment, higher rates of comorbidities, and suicidal behavior as well as worse socio-economic backgrounds. Moreover, a recent study showed violent victimization to be a better predictor for violent behavior than current psychopathology (38). Overall, the results of the present study suggest that female forensic patients with schizophrenia have more severe, clinically complex, and refractory diseases than their male counterparts.

When interpreting the results of our study, a number of limitations have to be considered. First, the data was collected by institutional personnel and therefore might be less reliable and valid compared to a standardized data collection done by non-institutional personnel. However, data quality for both samples was comparable thanks to the use of a standardized data entry form and collection procedure. Second, our findings are preliminary due to small sample sizes and the exploratory nature of this study. Nevertheless, some significant results persisted even after statistical correction for multiple testing, suggesting robust gender differences in psychopathological, neurological, and metabolic status. It must also be considered that our samples are subject to local limitations with the female sample being collected at a single institution and the male sample in two neighboring forensic institutions in the same federal state in Germany as the female sample (8). This makes it difficult to generalize and transfer the results to other institutions and regions, as the results could to some extent reflect local or clinic-specific treatment strategies. On the other hand, this unity of place can be seen as a methodological advantage in that it enabled homogeneous data collection and largely excluded other influencing factors such as regional or national differences in application practices (7).

Furthermore, as already mentioned, the more frequent use of SGAs in depot form in women could be based on a confounding cohort effect (39) due to the time lapse of 4–5 years between data collection for the male and female samples, making it difficult to clearly interpret the results. At the same time, this may counteract the disadvantages of a pure cross-sectional study and enable causal inferences regarding the relationship between psychopharmacological treatment and the occurrence of side effects (8). Thus, one could hypothesize that, in the sense of a trend to evaluate antipsychotic drugs based on the side effect profiles in accordance with Hasan et al. (1), the prescription of the novel aripiprazole depot preparation in the female

sample occurred in favor of the goal of reducing metabolic side effects (40), albeit at the expense of residual psychopathological symptoms. This hypothesis could be tested in a future study, for example by questioning the treating physicians. Further research with larger samples and several locations should also follow in order to substantiate our findings and examine gender-specific differences in psychopharmacological treatment strategies with regard to recidivism.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of Ulm University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MD, VK, PR, and NV designed the study. JM, VW, IS, PR, and MF were responsible for administration of data collection. JM, PR, and JS conducted the literature research. JM wrote the first draft of the manuscript. JM and JS conducted the statistical analysis. All authors read and approved the final version of the manuscript.

FUNDING

This study was funded by the Bavarian State Ministry for Family, Labor and Social Affairs, Germany.

REFERENCES

1. Hasan A, Falkai P, Lehmann I, Janssen B, Wobrock T, Zielasek J, et al. Die aktualisierte S3-leitlinie schizophrenie. *Nervenarzt.* (2016) 91:26–33. doi: 10.1007/s00115-019-00813-y
2. Leucht S, Cipriani A, Spineli L, Mavridis D, Orey D, Richter F, et al. Comparative efficacy and tolerability of 15 antipsychotic drugs in schizophrenia: a multiple-treatments meta-analysis. *Lancet.* (2013) 382:951–62. doi: 10.1016/S0140-6736(13)60733-3
3. Harvey RC, James AC, Shields GEA. Systematic review and network meta-analysis to assess the relative efficacy of antipsychotics for the treatment of positive and negative symptoms in early-onset schizophrenia. *CNS Drugs.* (2016) 30:27–39. doi: 10.1007/s40263-015-0308-1
4. Longden E, Read J. Assessing and reporting the adverse effects of antipsychotic medication: a systematic review of clinical studies, and prospective, retrospective, and cross-sectional research. *Clin Neuropharmacol.* (2016) 39:29–39. doi: 10.1097/WNF.0000000000000117
5. Walsh E, Buchanan A, Fahy T. Violence and schizophrenia: examining the evidence. *Br J Psychiatry.* (2002) 180:490–5.
6. Stompe T, Schanda H. Psychopharmocotherapy of schizophrenia in forensic and general psychiatry. *Neuropsychiatrie.* (2011) 25:75–84.
7. Stübner S, Yundina E, Mußmann L, Korbmacher J, Brieger P, Steinböck H. Psychopharmaka–anwendungspraxis in Maßregelvollzug und allgemeinpsychiatrie im vergleich. *Psychiatr Prax.* (2021) 48:173–4. doi: 10.1055/a-1540-5186
8. Vasic N, Segmiller F, Rees F, Jäger M, Becker T, Ormanns N, et al. Psychopharmacologic treatment of in-patients with schizophrenia: comparing forensic and general psychiatry. *J Forens Psychiatry Psychol.* (2017) 29:1–15.
9. Fazel S, Långström N, Hjern A, Grann M, Lichtenstein P. Schizophrenia, substance abuse, and violent crime. *JAMA.* (2009) 301:2016–23.
10. Fazel S, Wolf A, Palm C, Lichtenstein P. Violent crime, suicide, and premature mortality in patients with schizophrenia and related disorders: a 38-year total population study in Sweden. *Lancet Psychiatry.* (2014) 1:44–54. doi: 10.1016/S2215-0366(14)70223-8
11. de Vogel V, Nicholls TL. Gender matters: an introduction to the special issues on women and girls. *Int J Forens Ment Health.* (2016) 15:1–25.
12. Günther MP, Lau S, Kling S, Sonnweber M, Habermeyer E, Kirchebner J. Different needs in patients with schizophrenia spectrum disorders who behave aggressively towards others depend on gender: a latent class analysis approach. *Ann Gen Psychiatry.* (2021) 20:20. doi: 10.1186/s12991-021-00343-5
13. Abel KM, Drake R, Goldstein JM. Sex differences in schizophrenia. *Int Rev Psychiatry.* (2010) 22:417–28.
14. Usall J, Araya S, Ochoa S, Busquets E, Gost A, Marquez M. Gender differences in a sample of schizophrenic outpatients. *Compr Psychiatry.* (2001) 42:301–5. doi: 10.1053/comp.2001.24582
15. Tang YL, Gillespie CF, Epstein MP, Mao PX, Jiang F, Chen Q, et al. Gender differences in 542 Chinese inpatients with schizophrenia. *Schizophr Res.* (2007) 97:88–96. doi: 10.1016/j.schres.2007.05.025
16. Seeman MV. Gender differences in the prescribing of antipsychotic drugs. *Am J Psychiatry.* (2004) 161:1324–33.
17. Bauer P, Knörnschild C. Frauen im Maßregelvollzug. In: Müller-Isberner R, Born P, Eucker S, Eusterschulte B editors. *Praxishandbuch Maßregelvollzug – Grundlagen, Konzepte und Praxis der Kriminaltherapie*. Berlin: MWV (2017). p. 335–41.
18. Kay SR, Opler LA, Lindenmayer JP. The positive and negative syndrome scale (PANSS): rationale and standardisation. *Br J Psychiatry.* (1989) 155:59–67.
19. Overall JE, Gorham DR. The brief psychiatric rating scale. *Psychol Rep.* (1962) 10:799–812.
20. Gerbaldo H. *Negativsymptomatik: Vier aktuelle methodische Aspekte*. Berlin: Springer (2013).
21. Kirkpatrick B, Buchanan RW, McKenny PD, Alphs LD. Carpenter JrWT. The schedule for the deficit syndrome: an instrument for research in schizophrenia. *Psychiatry Res.* (1989) 30:119–23.
22. Endicott J, Spitzer RL, Fleiss JL, Cohen J. The global assessment scale: a procedure for measuring overall severity of psychiatric disturbance. *Arch Gen Psychiatry.* (1976) 33:766–71.
23. Simpson GM, Angus JW. A rating scale for extrapyramidal side effects. *Acta Psychiatr Scand.* (1970) 45:11–9.
24. Barnes TR. A rating scale for drug-induced akathisia. *Br J Psychiatry.* (1989) 154:672–6.
25. Guy W. *ECDEU Assessment Manual for Psychopharmacology*. Rockville: National Institute of Mental Health (1976).
26. IBM Corp. *IBM SPSS Statistics for Windows, Version 27.0.* Armonk, NY: IBM Corp. (2020).
27. Gardner DM, Murphy AL, O'Donnell H, Centorrino F, Baldessarini RJ. International consensus study of antipsychotic dosing. *Am J Psychiatry.* (2010) 167:686–93.
28. Krammer S, Eisenbarth H, Fallegger C, Liebrenz M, Klecha D. Sociodemographic information, aversive and traumatic events, offence-related characteristics, and mental health of delinquent women in forensic-psychiatric care in Switzerland. *Int J Offender Ther Comp Criminol.* (2018) 62:3815–33. doi: 10.1177/0306624X17749638
29. Niendam TA, Bearden CE, Zinberg J, Johnson JK, O'Brien M, Cannon TD. The course of neurocognition and social functioning in individuals at ultra high risk for psychosis. *Schizophr Bull.* (2007) 33:772–81.

30. Wang J, Zhang SM, Zhong SL, Mellsop G, Guo HJ, Li QG, et al. Gender differences among homicide offenders with schizophrenia in Hunan Province, China. *Psychiatry Res.* (2019) 271:124–30. doi: 10.1016/j.psychres.2018.11.039
31. Coid JW, Kahtan N, Gault S, Jarman B. Women admitted to secure forensic psychiatry services: I. Comparison of women and men. *J Forensic Psychiatry.* (2000) 11:275–95. doi: 10.1002/cbm.1949
32. Riedel M, Schennach R. Aripiprazol-depot. *Psychiatrie.* (2014) 11:203–11.
33. Pillinger T, McCutcheon RA, Vano L, Mizuno Y, Arumuham A, Hindley G, et al. Comparative effects of 18 antipsychotics on metabolic function in patients with schizophrenia, predictors of metabolic dysregulation, and association with psychopathology: a systematic review and network meta-analysis. *Lancet Psychiatry.* (2020) 7:64–77. doi: 10.1016/S2215-0366(19)30416-X
34. Anderson SG, Livingston M, Couchman L, Smith DJ, Connolly M, Miller J, et al. Sex differences in plasma clozapine and norclozapine concentrations in clinical practice and in relation to body mass index and plasma glucose concentrations: a retrospective survey. *Ann Gen Psychiatry.* (2015) 14:39. doi: 10.1186/s12991-015-0075-x
35. Fisher H, Morgan C, Dazzan P, Craig T, Morgan K, Hutchinson G, et al. Gender differences in the association between childhood abuse and psychosis. *Br J Psychiatry.* (2009) 194:319–25.
36. Gunter TD, Chibnall JT, Antoniak SK, McCormick B, Black DW. Relative contributions of gender and traumatic life experience to the prediction of mental disorders in a sample of incarcerated offenders. *Behav Sci Law.* (2012) 30:615–30. doi: 10.1002/bsl.2037
37. Landgraf S, Blumenauer K, Osterheider M, Eisenbarth H. A clinical and demographic comparison between a forensic and a general sample of female patients with schizophrenia. *Psychiatry Res.* (2013) 210:1176–83. doi: 10.1016/j.psychres.2013.09.009
38. Buchanan A, Sint K, Swanson J, Rosenheck R. Correlates of future violence in people being treated for schizophrenia. *Am J Psychiatry.* (2019) 176:694–701.
39. Keyes KM, Utz RL, Robinson W, Li G. What is a cohort effect? Comparison of three statistical methods for modeling cohort effects in obesity prevalence in the United States, 1971-2006. *Soc Sci Med.* (2010) 70:1100–8. doi: 10.1016/j.socscimed.2009.12.018
40. Nasrallah HA, Newcomer JW, Risinger R, Du Y, Zummo J, Bose A, et al. Effect of aripiprazole lauroxil on metabolic and endocrine profiles and related safety considerations among patients with acute schizophrenia. *J Clin Psychiatry.* (2016) 77:1519–25. doi: 10.4088/JCP.15m10467

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers | Frontiers in Psychiatry

TYPE Original Research
PUBLISHED 19 July 2022
DOI 10.3389/fpsyt.2022.924861

OPEN ACCESS

EDITED BY
Najat R. Khalifa,
Queen's University, Canada

REVIEWED BY
Jacopo Lisoni,
Asst Spedali Civili di Brescia, Italy
Andrew Robert Bickle,
Queen's University, Canada

*CORRESPONDENCE
Juliane Gerth
juliane.gerth@uni-konstanz.de

SPECIALTY SECTION
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

RECEIVED 20 April 2022
ACCEPTED 27 June 2022
PUBLISHED 19 July 2022

CITATION
Gerth J, Endrass J, Weber M, Graf M, Singh JP and Rossegger A (2022) Exploring the mental healthcare needs of Swiss pre-trial detainees: A pilot investigation of an on-site psychiatric day clinic. *Front. Psychiatry* 13:924861. doi: 10.3389/fpsyt.2022.924861

Exploring the mental healthcare needs of Swiss pre-trial detainees: A pilot investigation of an on-site psychiatric day clinic

Juliane Gerth[1,2]*, Jérôme Endrass[1,2,3], Michael Weber[1,2], Marc Graf[3,4], Jay P. Singh[1,5] and Astrid Rossegger[1,2,3]

[1]Department of Psychology, University of Konstanz, Konstanz, Germany, [2]Department of Research and Development, Office of Corrections and Rehabilitation, Zurich, Switzerland, [3]Department of Forensic Psychiatry, University of Basel, Basel, Switzerland, [4]Department of Forensic Psychiatry, University Psychiatric Hospitals, Basel, Switzerland, [5]Publication Academy Inc., Reston, VA, United States

Introduction: Research has established that justice-involved individuals experience significant mental health problems. However, mental healthcare in correctional settings is often not sufficiently accessible to meet the demand. Hence, to improve the availability of mental healthcare services, especially for pre-trial detainees, the first Swiss on-site psychiatric day clinic (PDC) was established in 2019. The present cross-sectional observational study aimed to evaluate the need of psychiatric care in pre-trial detention and the PDC's potential to improve it.

Methods: File record data were collected from the Office of Corrections and Rehabilitation of the Canton of Zurich. Differences in primary psychiatric care consultations and psychiatric hospital admissions between pre-trial detainees and sentenced prisoners were examined. In addition, a total cohort of pre-trial detainees of the first 18 months of PDC operations was examined to identify differences between three treatment groups: (1) pre-trial detainees exclusively treated in the PDC ($n = 41$), (2) pre-trial detainees exclusively treated in a psychiatric hospital ($n = 58$), and (3) pre-trial detainees treated in both the PDC as well as a psychiatric hospital ($n = 16$).

Results: In the 5 years before the PDC opened, pre-trial detainees had significantly more primary psychiatric care consultations and were admitted to psychiatric hospitals on significantly more occasions than were sentenced prisoners. In the first 18 months of the PDC, psychiatric hospital admission rates for pre-trial detainees decreased by 18.5% and pretrial detainees exclusively treated in the PDC differed significantly from other treatment groups concerning mental disorder, gender, and alleged index offense. They were more likely to be diagnosed with adjustment disorders and were less likely to be diagnosed with schizophrenia spectrum disorder.

Conclusion: The use of mental health care among pre-trial detainees is significantly more frequent than among sentenced prisoners concerning both primary care and inpatient treatment. Since establishment of the novel on-site PDC admissions to psychiatric hospitals were found to decrease. Data indicates that especially male pre-trial detainees with adjustment disorders benefitted from this innovative path forward in correctional healthcare. Further research is needed to improve the PDC's service for female pre-trial detainees.

KEYWORDS

mental health, prison psychiatry, pre-trial detention, psychiatric day clinic, prevention of mental crises

Introduction

In Europe, 1 in 4 people will meet the diagnostic criteria for a mental illness in their lifetime (1), with an annual prevalence of 15–20% (2, 3). At particularly high risk are individuals in correctional settings, with international research consistently finding increased rates of major groups of mental disorders compared to the general population (4–6). With regards to specific diagnoses, there is some variability between studies, samples and countries. However, systematic reviews and meta-analyses reveal that substance use disorders with prevalence rates between 18 and 30% (7) occur up to six times (8), personality disorders with prevalence rates of up to 65% (9) approximately six times (10), psychotic disorders with 4% prevalence (5) more than ten times (11), major depression with a prevalence of about 11% (5) almost three times (12), and attention-deficit/hyperactivity disorders with slightly more than 25% prevalence at least five times more often in justice-involved persons compared to the general population (13, 14).

Despite the global literature base in this area, research exploring the prevalence of mental illness in Swiss correctional settings is scarce. A systematic search for peer-reviewed primary studies published through March 2022 using PubMed, PsycINFO, and PSYNDEX[1] identified only 12 such investigations (Table 1). In the three studies which examined total correctional cohorts in Switzerland, overall prevalence rates were found to be higher than those of the general population for adults in pre-trial detention [(26); N = 2,195], adults in penitentiaries [(24); N = 1,664], and adolescents in pre-trial detention [(16); N = 122]. Compared to general population controls, adults in pre-trial detention had noticeably higher rates of substance abuse disorders, personality disorders, and adjustment disorders, whereas adults in penitentiaries had noticeably higher rates of not just substance abuse disorders and personality disorders but also delusional disorders and stress-related disorders. The prevalence of mental illness for adolescents in pre-trial detention was found to be of particular concern, with 90% diagnosed with a behavioral or emotional condition, including substance abuse disorders, stress-related disorders, anxiety disorders, and mood disorders. Such findings underscore the need for adequate access to mental healthcare services in pre-trial as well as in penitentiary settings in the country.

International human rights organizations like the United Nations or the Council of Europe have established that "prisoners should enjoy the same standards of health care that are available in the community" [(32), p. 8] and "All necessary medical, surgical and psychiatric services, including those available in the community, shall be provided to the prisoner for that purpose [(33), art. 40.2 and 40.5]. Though need for treatment is recognized in criminal justice settings and mental health care is generally provided, there are great barriers to establish equivalence. For example, there is no free choice of psychiatric expert or access to the whole range of treatment options provided to individuals in the community including the setting of treatment. While in Swiss criminal justice settings psychiatric care is typically delivered *via* intra-institutional primary psychiatric care (i.e., psychiatric consultation hours on demand either by an external provider or internal psychiatric staff) and inpatient treatment in psychiatric hospitals [for those individuals suffering from an acute mental crisis; (34)], the care system in the community offers further treatment options, e.g., day clinics which have strongly gained

1 The following search terms [title or abstract] were applied: (mental health OR mental illness OR mental disorder OR psychiatric illness) AND (prison* OR detention OR inmates OR incarcerated) AND (Switzerland OR swiss). This search strategy resulted in 64 hits (PubMed: n = 32; PsycINFO: n = 25; PSYNDEX: n = 7). After removing 18 duplicate records, 34 of the remaining 46 unique hits were excluded as they either reported on the same sample as a previous study, did not report prevalence rates of mental disorders in a prison sample, or did not report on a prison sample in Switzerland.

TABLE 1 Peer-reviewed studies on the prevalence of mental health disorders among imprisoned persons in Switzerland.

Study	Population	Canton	*N*	Assessment method	Prevalence of mental health conditions	
Augsburger et al. (15)	Imprisoned female offenders in penitentiary for ≥4 weeks	Vaud	60	Review of medical records + Clinical interviews + Mental health screening scales	Any mental health problems	43.3%
					Illicit substance use	49.2%
					Severe anxiety symptoms	30.0%
					Severe depressive symptoms	20.0%
Bessler et al. (16)	Total cohort of adolescents in pre-trial or security detention	Zurich	122	Review of expert opinions	ICD-10: Fx	90.2%
					ICD-10: F1	64.8%
					ICD-10: F3	28.7%
					ICD-10: F41	32.8%
					ICD-10: F43.1	14.0%
					ICD-10: F9	80.3%
Eytan et al. (17)	Persons in pre-trial detention treated by the medical service	Geneva	1,510	Review of medical records + ICPC-2	Any symptoms of a mental health disorder	45.8%
Gisin et al. (18)	Imprisoned adolescents with ≥1 psychiatric consultation in the past year	Geneva	118	Review of expert opinions	ICD-10: Fx	88%
					ICD-10: F91	29.0%
					ICD-10: F12	32.3%
					ICD-10: F10	25.8%
					ICD-10: F60/61	25.8%
					ICD-10: F43.2	19.4%
Haller et al. (19)	Imprisoned adolescents seen at least once by a physician	Geneva	195	Review of medical records + ICPC-2	Any mental health or substance use problem	87.2%
					Alcohol abuse	26.2%
					Cannabis abuse	31.3%
					Adolescent behavior symptoms/complaints	22.6%
					Acute stress reaction	17.4%
					Feeling anxious/nervous/tense	14.4%
					Depressive disorder	8.7%
					Personality disorder	6.7%
					Psychosis or psychotic symptoms	3.6%
Heller et al. (20)	Imprisoned adolescents in intensive interdisciplinary care in a medicalized environment	Geneva	86	K-SADS-PL	Conduct disorders	59.4%
					Illicit substance use disorders	58.0%
					Alcohol use disorder	30.4%
					ADHD	23.2%
					Oppositional defiant disorder	18.8%
					Depression	11.6%
					Anxiety disorder	11.6%
Krammer et al. (21)	Female offenders assessed by forensic psychiatric experts	Bern	239	Review of expert opinions	ICD-10: F1	64.7%
					ICD-10: F2	11.9%
					ICD-10: F3	29.2%
					ICD-10: F43	22.2%
					ICD-10: F6	59.9%
Krammer et al. (22)	Imprisoned male offenders with a history of psychiatric treatment	Bern	39	SCL-90-R	ICD-10: F1	57.7%
					ICD-10: F6	69.2%
Krammer et al. (23)	Imprisoned male offenders	Bern	49	IES-R	ICD-11: 6B4	22.5%

(Continued)

TABLE 1 Continued

Study	Population	Canton	*N*	Assessment method	Prevalence of mental health conditions	
Moschetti et al. (24)	Total cohort of imprisoned persons in closed facilities of the Canton of Vaud	Vaud	1,664	Review of expert opinions	ICD-10: F1	26.2%
					ICD-10: F2	5.3%
					ICD-10: F3	2.2%
					ICD-10: F4	15.9%
					ICD-10: F6	16.2%
Urbaniok et al. (25)	Male prisoners in court-ordered treatment or pre-trial detention	Zurich	86	PDS	PTSD	27%
Wolff et al. (26)	Total cohort of adult persons leaving pre-trial detention	Geneva	2,195	Review of medical records + ICPC-2	Alcohol abuse	34.8%
					Illicit substance abuse	40.2%
					Psychiatric problems (excl. substance abuse)	16.4%
					Depression	7.4%
					Personality disorder	5.5%
					Adjustment disorder	4.5%
					PTSD	1.0%
					Psychosis	1.0%

ADHD, Attention-Deficit/Hyperactivity Disorder; ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th Revision (27); ICD-10: Fx, any mental or behavioral disorder referring to ICD-10; ICD-10: F1, Mental and behavioral disorders due to psychoactive substance use; ICD-10: F2, Schizophrenia, schizotypal, and delusional disorders; ICD-10: F3, Mood (affective) disorders; ICD-10: F32, Mood (affective) disorders, depressive episodes; ICD-10: F4, Neurotic, stress-related, and somatoform disorders; ICD-10: F40, Phobic anxiety disorders; ICD-10: F41, Other anxiety disorders; ICD-10: F43, Reaction to severe stress, adjustment disorders; ICD-10: F43.1/ICD-11: 6B4, Posttraumatic stress disorder; ICD-10: F6, Disorders of adult personality and behavior; ICD-10: F9, Behavioral and emotional disorders with onset usually occurring in childhood and adolescence; ICPC-2, International Classification of Primary Care, Second Edition (28); IES-R, Impact of Event Scale, Revised (29); K-SADS-PL, Kiddie Schedule for Affective Disorders and Schizophrenia, Present and Lifetime (30); PDS, Posttraumatic Diagnostic Scale; PTSD, Posttraumatic stress disorder; SCL-90-R, Symptom Checklist, Revised (31).

in importance in the course of psychiatric reforms in the mid-20th century, that aimed at deinstitutionalizing (35). Day clinics offer multimodal treatment in a setting similar to patients' usual environments and enable to address personal resources as well issues and conflicts typical to the patient's environment (35, 36). They are suitable for patients who do not sufficiently benefit from outpatient treatment but for whom placement in a psychiatric hospital would exceed their actual treatment needs or may be ineffective. There are several models of day clinics which focus on different aspects of treatment. These models can be summarized into the following categories: Day clinics which provide treatment in acute crises either as alternative to inpatient treatment or extension of outpatient treatment (acute treatment), day clinics that support transition from inpatient treatment to the community (rehabilitation) and day clinics that provide long-term support to settle in the society incl. to manage work and social contacts (chronic care) (35, 37). Several randomized controlled trials have shown that day clinics conceptualized to offer an alternative to inpatient treatment are as effective as inpatient treatment (38–40). Research also indicates that patients with moderate symptoms (39) or diagnosed with affective or anxiety disorders (41) particularly benefit from treatment in day clinics. On the basis of a meta-analysis on nine randomized controlled trials (42) estimated that about one quarter of individuals admitted to psychiatric hospitals could actually effectively be treated in acute day clinics. Additionally, research suggests that acute psychiatric day clinics are appropriate from a cost-benefit perspective as it is less expensive (20–45%) for the same level of effectiveness (37, 38, 42).

Little is currently known about day clinics in criminal justice settings. Few experiences are published on on-site day clinics in penitentiaries of the Netherlands and Germany (43, 44), both providing treatment to mitigate acute crises. To our knowledge information is lacking for pre-trial detention completely. Pre-trial detention, however, is argued to be the most stressful period of imprisonment (45–47) when individuals were just been torn out of everyday life, are confronted with uncertainty about further proceedings of their case and still have to adapt to particular restrictive conditions of imprisonment (due to securing the criminal proceedings) compared to those of penitentiaries. The vulnerability of individuals in pre-trial detention (hereinafter "detainees") is reflected by a higher rate of mental disorders compared to individuals in penitentiaries [hereinafter "prisoners"; (48, 49)]

as well as their particularly high suicide rates (50, 51). In Switzerland, they account for more than half of all suicides in prisons although representing only about one third of the Swiss inmate population (52–56). Hence, in 2019, the Canton of Zurich opened an on-site psychiatric day clinic (PDC) to provide intensive treatment services to detainees and fill the gap between intra-institutional primary care consultations and external hospital admissions. It was aimed to care for individuals at risk of acute crisis so as to avoid hospitalization and also, based on the principle of equivalence, provide resources for mentally burdened detainees who could yet not adequately be addressed by the previous treatment options. Detainees are admitted on a voluntary basis and upon recommendation of the attending psychiatrist of primary psychiatric care. The individual's voluntariness is understood to be one important condition for the success of an intervention in the PDC. The new PDC's four full-time nurses and one full-time psychiatrist simultaneously serve nine detainees at a time (57), with the sole admission criteria for the clinic being treatment compliance and exclusion criteria including acute risk of self-harm, acute risk of violence toward others, current psychotic episodes, and deprivation. Besides its comparably high health care resources, the PDC is characterized by more mobility, more access to job activities, sports, and education as well as extensive group activities compared to the usual setting of pre-trial detention (58, 59). Different from day clinics in the community, patients stay in the PDC also during nights, as everyday transfers from pre-trial detention centers to the PDC are not feasible. The PDC was the first of its kind in Switzerland, though similar facilities have since opened in a pre-trial detention center in the Canton of Basel-Stadt in 2021 (60) and a penitentiary in the Canton of Bern in 2022 (61).

Although research from non-correctional settings in Switzerland and other countries has found that PDCs provide effective mental health services, no such research has been conducted exploring the effectiveness of PDC services for pre-trial detainees.

Study aim and research questions

The aim of the present cross-sectional observational study was to explore three research questions: (1) Is the use of mental healthcare services more frequent among pre-trial detainees than sentenced prisoners? (2) Did the opening of the PDC result in a reduction in psychiatric hospitalizations among pre-trial detainees? (3) Do pre-trial detainees treated exclusively in the PDC differ systematically from pre-trial detainees (also) admitted to psychiatric hospitals?

Methods

Setting

The correctional system of Switzerland is decentralized, operating separately in each of its 26 cantons. In the country's most populous canton, the Canton of Zurich, seven pre-trial detention centers and five penitentiaries are currently operated by the Office of Corrections and Rehabilitation of the Canton of Zurich (OCR). Pre-trial detention is carried out with a total capacity of currently 408 places [Justizvollzug und Wiedereingliederung; (62)] corresponding to ∼1,800 admissions each year (63). In the Canton of Zurich pre-trial detainees as well as sentenced prisoners have access to psychiatric care in various ways. Primary outpatient psychiatric care is provided by an external agency *via* psychiatric consultations on demand—at the own request of the imprisoned individual or on indication of prison staff. In acute psychiatric crises which cannot be dealt with within the framework of outpatient primary psychiatric care, individuals are transferred to acute wards of general or forensic psychiatric hospitals. Since February 2019, mainly pre-trial detainees can also be admitted to an on-site PDC, which addresses individuals who do neither sufficiently benefit from outpatient primacy psychiatric care, nor is transfer to an acute ward (yet) an appropriate treatment. The PDC is part of the OCR's Department of Pre-trial Detention and is located at the Limmattal pre-trial detention center. All pre-trial detainees from any of the seven centers have access to its services, as do sentenced prisoners when there is spare capacity. Admissions to the PDC are voluntary. Clinically, admission is based on the recommendation of medical staff in pre-trial detention. Legally, admission is based on the responsibility of the OCR to provide medical and mental health care for pre-trial detainees in need. Taking into account an individual's voluntary desire for admission and considering the previously mentioned exclusion criteria, the head of PDC makes the final decision on admission.

Study design and samples

The study followed an observational cross-sectional design, with data collected retrospectively from existing records from the OCR on annual occupation rate of pre-trial detention centers and penitentiaries as well as psychiatric consultations, admissions to psychiatric hospitals and admissions to the PDC including diagnosis of a mental and behavioral disorder listed as main reason for intervention and diagnosed by medical staff in charge. To investigate Research Question 1, i.e., whether pre-trial detainees accessed mental healthcare services more often than sentenced prisoners, a total count was taken of primary

psychiatric care consultations ($k_{Consultations}$ = 24,928) and psychiatric hospital admissions ($k_{Admissions}$ = 801) for pre-trial detainees and sentenced prisoners in the 5 years prior to the opening of the PDC (January 1, 2014, to December 31, 2018). Individuals kept in the facility responsible for immigration detention were excluded.

To explore Research Question 2, i.e., whether the rate of psychiatric hospital admissions changed for pre-trial detainees before compared to after the opening of the PDC, total counts of all pre-trial detainee hospitalizations were extracted for the respective periods of January 1, 2014, to December 31, 2018 ($k_{Admissions}$ = 801) and July 1, 2019, to December 31, 2020 ($k_{Admissions}$ = 110).

Finally, to examine Research Question 3, i.e., whether pre-trial detainees treated exclusively in the PDC differ systematically from pre-trial detainees admitted to psychiatric hospitals, data were extracted on all detainees who were admitted in the PDC or a psychiatric hospital between July 1, 2019, and December 31, 2020 (N = 115). This sample was divided into three treatment groups: (1) individuals exclusively treated in the PDC (hereinafter "PDC-Only"; n = 41, 35.7%), (2) individuals exclusively treated in a psychiatric hospital (hereinafter "Hospital Only"; n = 58, 50.4%), and (3) individuals treated in both the PDC as well as a psychiatric hospital (hereinafter "PDC + Hospital"; n = 16, 13.9%).[2]

Statistical analysis

Data were analyzed descriptively, and inferential statistics were calculated to assess group differences, with t-tests conducted for continuous variables and Fisher's exact tests or χ^2 tests conducted for dichotomous variables. To explore changes in psychiatric hospitalization (Research Question 2), total counts of admitted pre-trial detainees in different time periods were calculated in relation to the annual occupancy rate of available spots in the observed pre-trial detention centers and penitentiaries. Such spots cannot be occupied by multiple individuals at the same time; however, in the same year, such spots can be occupied by several individuals, due to releases and new entries. To explore group-level differences between PDC-pre-trial detainees and pre-trial detainees treated elsewhere (Research Question 3) the following information was extracted from file records: *Principal diagnosis* [the ICD-10 (27) diagnosis of a mental and behavioral disorder listed as the main reason for admission to the PDC or a psychiatric hospital], *gender* (0 = male, 1 = female), *age* (continuous, in years) and *alleged index offense* [the reason for current detention in accordance with the articles of the Swiss Criminal Code (64), wherein for analysis, the offenses were combined into the following broader categories: [1] hands-on violent offenses, [2] sexual offenses, [3] threats/extortion/coercion, [4] property crimes, [5] drug-related offenses, and [6] other]. All statistical analyses were performed with Stata 16 SE (65) with a two-tailed significance level of $\alpha = 0.05$. The proportion of missing values was below 5% for all variables included in the analyses, with missing values excluded from analyses on a case-wise basis.

2 If individuals were hospitalized more than once within the observed period, only the first hospitalization was included to avoid correlated data.

Results

Research question 1: Is the use of mental healthcare services more frequent among pre-trial detainees than sentenced prisoners?

Of the 24,928 primary psychiatric care consultations carried out between 2014 and 2018, 13,478 (54.1%) involved pre-trial detainees and 11,450 (45.9%) involved sentenced prisoners. There was a statistically significant difference between the average annual number of consultations per pre-trial detention spot (M = 7.70, SD = 1.18) and the average annual number of consultations per penitentiary spot (M = 3.43, SD = 0.42), t = 3.44, $p < 0.001$ (Table 2), i.e., pre-trial detainees are significantly more often accessing primary psychiatric care than sentenced prisoners. More than half (53%) of all individuals in pre-trial detention and penitentiaries treated in primary care were diagnosed with a neurotic, stress-related, or somatoform disorder (ICD-10: F4); 23% had a mental or behavioral disorder due to psychoactive substance use (ICD-10: F1); 6% each had a schizophrenia, schizotypal, or delusional disorder (ICD-10: F2) or a disorder of adult personality or behavior (ICD-10: F6). The principal diagnoses of detainees who received primary psychiatric care differed significantly from those of prisoners, $\chi^2_{(4,321,\ 6)} = 90.79$; $p < 0.001$ (Table 3).

Of the 801 psychiatric hospital admissions made between 2014 and 2018, 480 (59.9%) were pre-trial detainees and 321 (40.1%) were sentenced prisoners. There was a statistically significant difference between the average annual number of admissions per pre-trial detention spot (M = 0.27, SD = 0.08) and the average annual number of admissions per penitentiary spot (M = 0.10, SD = 0.02), t = 25.24, $p < 0.001$ (Table 2), i.e., pre-trial detainees are significantly more often admitted to psychiatric hospitals than sentenced prisoners. Of the individuals admitted to psychiatric hospitals, 40% were diagnosed with schizophrenia, schizotypal, or delusional disorders (ICD-10: F2, n = 195, 41.9%), followed by one-third admitted because of neurotic, stress-related, and somatoform disorders (ICD-10: F4, n = 151, 32.5%). The principal diagnoses of pre-trial detainees who were admitted to psychiatric hospitals differed significantly from those of sentenced prisoners, $\chi^2_{(465,\ 5)} = 13.81$; $p < 0.017$ (Table 4).

TABLE 2 Annual primary psychiatric care consultations and psychiatric hospital admissions between 2014 and 2018 by type of correctional setting.

Type of imprisonment	Annual number of spots *M* (*SD*)	Annual consultations *M* (*SD*)	Annual consultations per spots *M* (*SD*)	Annual admissions *M* (*SD*)	Annual admissions per spots *M* (*SD*)
Pre-trial detention	352.82 (29.33)	2,695.60 (302.99)	7.70 (1.18)	96.0 (26.50)	0.27 (0.08)
Penitentiary	669.30 (12.90)	2,290.00 (262.31)	3.43 (0.42)	64.20 (13.78)	0.10 (0.02)
Total	1,022.11 (37.26)	4,985.60 (522.86)	4.89 (0.62)	160.20 (31.44)	0.16 (0.04)

TABLE 3 Comparison of principal diagnoses in individuals receiving primary psychiatric care between 2014 and 2018 by type of correctional setting ($N = 4{,}321$).

	Pre-trial detention		Penitentiaries		Total	
Principal diagnosis	***n***	**%**	***n***	**%**	***n***	**%**
ICD-10: F1	571	21.0	405	25.4	976	22.6
ICD-10: F2	158	5.8	117	7.3	275	6.4
ICD-10: F3	104	3.8	66	4.1	170	3.9
ICD-10: F4	1,547	56.8	745	46.6	2,292	53.0
ICD-10: F6	102	3.7	147	9.2	249	5.8
ICD-10: F99	187	6.9	79	4.9	2.66	6.2
Other (ICD-10: F0, F5, F7, F8, F9)	55	2.0	38	2.4	93	2.2
Total	2,724	100.0	1,597	100.0	4,321	100.0

ICD-10: F1, Mental and behavioral disorders due to psychoactive substance use; ICD-10: F2, Schizophrenia, schizotypal, and delusional disorders; ICD-10: F3, Mood [affective] disorders; ICD-10: F4, Neurotic, stress-related and somatoform disorders; ICD-10: F6, Disorders of adult personality and behavior; ICD-10 F99, Unspecified mental disorder.

Research question 2: Did the opening of the PDC result in a reduction in psychiatric hospitalizations among pre-trial detainees?

Before the PDC started operating in 2019, 1 admission to a psychiatric hospital was registered for almost every 3rd occupied spot in pre-trial detention (0.27 per occupied pre-trial detention spot). After regular operation of the PDC began, this was reduced to 1 admission for almost every 5th occupied pre-trial detention spot (0.22 per occupied pre-trial detention spot). In other words, 27 hospital admissions per 100 pre-trial detention spots decreased to 22 after the PDC started operating. This represents a statistically significant reduction of 18.5% in psychiatric hospital admissions [$t_{(90)} = 6.46$, $p < 0.001$].

Research question 3: Do detainees treated exclusively in the PDC differ systematically from detainees (also) admitted to psychiatric hospitals?

PDC-Only pre-trial detainees were found to differ statistically from Hospital-Only pre-trial detainees (Table 5). With regards to their principal psychiatric diagnosis, PDC-Only pre-trial detainees were significantly less likely than Hospital-Only pre-trial detainees to be diagnosed with the ICD-10: F2 conditions of schizophrenia, schizotypal disorder, or delusional disorders ($n_{\text{PDC-Only}} = 3$, 7.3%; $n_{\text{Hospital-Only}} = 33$, 57.9%), $\chi^2_{(98,\,1)} = 26.25$, $p < 0.001$. PDC-Only pre-trial detainees were however significantly more likely than Hospital-Only detainees found to be diagnosed with the ICD-10: F4 conditions of neurotic, stress-related, or somatoform disorders ($n_{\text{PDC-Only}} = 22$, 53.7%; $n_{\text{Hospital-Only}} = 10$, 17.5%), $\chi^2_{(98,\,1)} = 14.14$, $p < 0.001$. With regards to gender, no females were treated exclusively in the PDC ($n_{\text{PDC-Only}} = 0$, 0%), whereas ~1 in 8 of pre-trial detainees treated exclusively in psychiatric hospitals were female ($n_{\text{Hospital-Only}} = 8$, 13.8%), p[Fisher's exact test] = 0.019. Finally, although there were no statistically significant group-level differences in alleged index offenses, descriptive analyses revealed a trend toward more PDC-Only pre-trial detainees having been accused of a sexual offense ($n_{\text{PDC-Only}} = 9$, 22.0%) than were Hospital-Only pre-trial detainees ($n_{Hospital-Only} = 4$, 6.9%).

Comparisons between PDC-Only pre-trial detainees and PDC + Hospital pre-trial detainees did also reveale significant differences in principal psychiatric diagnoses (p[Fisher's exact test] < 0.001), gender (p[Fisher's exact test] = 0.019), and alleged index offenses (p[Fisher's exact test] = 0.036) see

TABLE 4 Comparison of principal diagnoses in individuals admitted to psychiatric hospitals for crisis intervention between 2014 and 2018 by type of correctional setting ($N = 465$).

	Pre-trial detention		Penitentiaries		Total	
Principal diagnosis	***n***	**%**	***n***	**%**	***n***	**%**
ICD-10: F1	17	6.2	8	4.1	25	5.4
ICD-10: F2	124	45.3	71	37.2	195	41.9
ICD-10: F3	24	8.8	14	7.3	38	8.2
ICD-10: F4	88	32.1	63	33.0	151	32.5
ICD-10: F6	18	6.6	28	14.7	46	9.9
Other (ICD-10: F0, F5, F7, F8, F9)	3	1.1	7	3.7	10	2.2
Total	274	100.0	204	100.0	465	100.0

Although there were 480 admissions to psychiatric hospitals for individuals in pre-trial detention between 2014 and 2018, no information about psychiatric diagnosis was available for 15 of them, resulting in a sample size of $N = 465$. ICD-10: F1, Mental and behavioral disorders due to psychoactive substance use; ICD-10: F2, Schizophrenia, schizotypal, and delusional disorders; ICD-10: F3, Mood (affective) disorders; ICD-10: F4, Neurotic, stress-related, and somatoform disorders; ICD-10: F6, Disorders of adult personality and behavior.

TABLE 5 Characteristics of individuals in Zurich's pre-trial detention centers treated in clinical settings between 1st July 2019 and 31st December 2020 ($N = 115$).

	PDC-only ($n = 41$)		Hospital-only ($n = 58$)		PDC + hospital ($n = 16$)	
	n	**%**	***n***	**%**	***n***	**%**
Principal diagnosis						
ICD-10: F1	4	9.8	4	7.0	1	6.3
ICD-10: F2	3	7.3	33	57.9	10	62.5
ICD-10: F3	10	24.4	9	15.8	1	6.3
ICD-10: F4	22	53.7	10	17.5	3	18.8
ICD-10: F6	–	–	–	–	–	–
Other	2	4.9	1	1.8	1	6.3
Gender	41		58		16	
Female	0	0.0	8	13.8	3	18.8
Male	41	100.0	50	86.2	13	81.3
Age in years (*M, SD*)	34.4	8.7	34.5	11.3	36.4	13.5
Alleged index offense						
Violent offense (hands-on)	10	24.4	18	31.0	12	75.0
Sexual offense	9	22.0	4	6.9	1	6.3
Threat, extortion, coercion	8	19.5	16	27.6	1	6.3
Property crime	7	17.1	12	20.7	1	6.3
Drug-related offense	2	4.9	2	3.4	–	–
Other	5	12.2	6	10.3	1	6.3

PDC, Psychiatric day clinic; ICD-10: F1, Mental and behavioral disorders due to psychoactive substance use; ICD-10: F2, Schizophrenia, schizotypal, and delusional disorders; ICD-10: F3, Mood (affective) disorders; ICD-10: F4, Neurotic, stress-related, and somatoform disorders; ICD-10: F6, Disorders of adult personality and behavior.

(Figure 1). With regards to their principal psychiatric diagnosis, ∼2 in 3 of the PDC + Hospital pre-trial detainees were diagnosed with the ICD-10: F2 conditions of schizophrenia, schizotypal disorder, or delusional disorders ($n_{\text{PDC+Hospital}} = 10$, 62.5%) compared to <1 in 10 of the PDC-Only pre-trial detainees ($n_{\text{PDC−Only}} = 3$, 7.3%). However, PDC-Only pre-trial detainees were approximately three-times as likely to be diagnosed with ICD-10: F4 conditions of neurotic, stress-related, or somatoform disorders compared to PDC + Hospital pre-trial detainees ($n_{\text{PDC−Only}} = 22$, 53.7%; $n_{\text{PDC+Hospital}} = 3$, 18.8%). Furthermore, PDC-Only pre-trial detainees were approximately four-times as likely to be diagnosed with the ICD-10: F3 affective disorders compared to PDC + Hospital pre-trial detainees ($n_{\text{PDC−Only}} = 10$, 24.4%; $n_{\text{PDC+Hospital}} = 1$, 6.3%). In terms of gender, ∼1 in 5 pre-trial detainees in the PDC + Hospital group were female ($n_{\text{PDC+Hospital}} = 3$, 18.8%) compared to none of the detainees in the PDC-Only group. Finally, the majority of PDC + Hospital pre-trial detainees were accused of hands-on

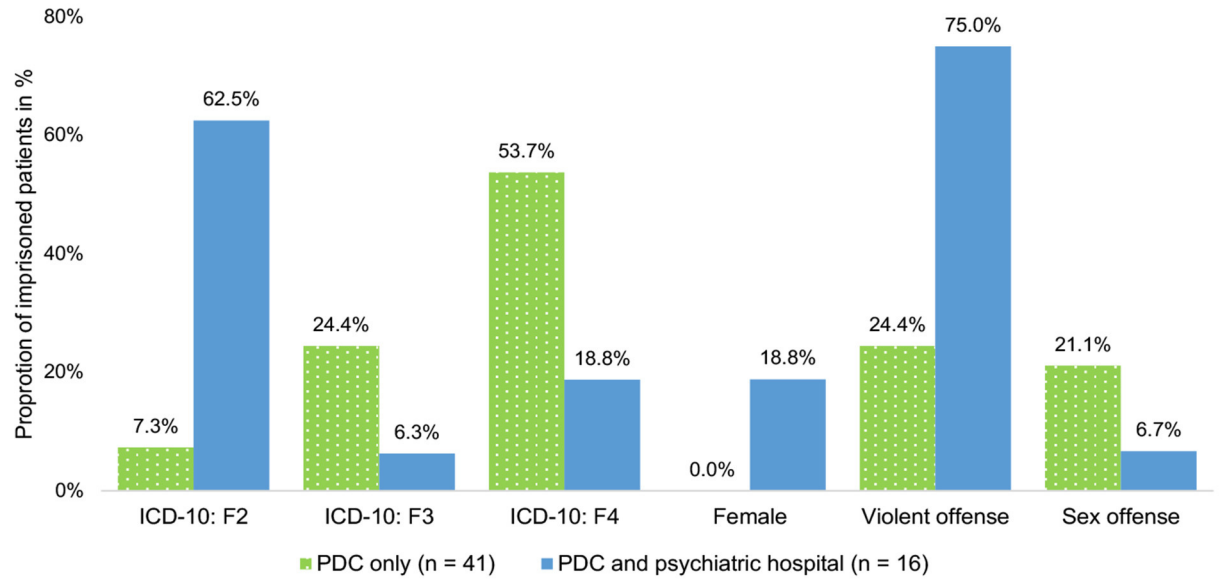


FIGURE 1
Comparing characteristics of individuals treated only in the psychiatric day clinic with patients treated in both the psychiatric day clinic as well as a psychiatric hospital.

violent offenses ($n_{PDC+Hospital}$ = 12, 75.0%) compared with only a quarter of the PDC-Only pre-trial detainees ($n_{PDC-Only}$ = 10, 24.4%).

Discussion

Psychiatric day clinics represent an evidence-based middle ground between low intensity psychiatric primary care and high intensity psychiatric hospitalization for individuals diagnosed with mental illnesses. Despite a growing literature on their effectiveness for general population controls (37, 38, 42), PDCs for justice-involved persons, who research has shown are particularly at risk for mental illness (5, 6), are rare, and to our knowledge no studies exist on such clinics' effectiveness for pre-trial detainees—a particularly vulnerable prison population. The aim of the present study was to address this gap by reviewing Canton of Zurich medical records for pre-trial detainees and sentenced prisoners both before and after a PDC began its operations in 2019.

First, the prevalence of primary psychiatric care consultations and psychiatric hospital admissions was assessed in the 5 years before the opening of the PDC, with pre-trial detainees being found to receive both more consultations and hospitalizations for crisis intervention relative to sentenced prisoners. For both correctional groups, the most common diagnoses cited as a cause for psychiatric consultation were neurotic, stress-related, or somatoform disorders (ICD-10: F4), followed by substance use disorders (ICD-10: F1). Regarding hospitalizations, both pre-trial detainees and sentenced prisoners were primarily admitted because of schizophrenia spectrum disorders (ICD-10: F2), followed by neurotic, stress-related, or somatoform disorders. The prevalence of adult disorders of personality and behavior was lower in pre-trial detainees [4% (primary care) and 7% (hospitalization)] than in sentenced prisoners [9% (primary care) and 15% (hospitalization)] and generally lower than rates reported in previous prison research [e.g., (66, 67)]. However, this may be due to the fact that information needed to diagnose such disorders was largely unavailable due to reliance on self-reports and rather short observation times. Moreover, adult disorders of personality and behavior may lead to acute psychiatric treatment less often than other disorders and thus, may be less often detected.

Second, the impact of an on-site acute psychiatric day clinic in pre-trial detention in the Canton of Zurich was examined. The goal of the PDC is to facilitate access to multimodal mental health care in the environment of pre-trial detention but under less restrictive conditions to prevent severe emotional crises which would otherwise require psychiatric hospitalization. Findings of the present study suggest that the PDC has positively impacted the provision of mental healthcare services during pre-trial detention, with hospital admissions decreasing by 18.5% in the clinic's first 18 months of operation. Furthermore, three of four (71.9%) pre-trial detainees admitted to the PDC did not require more intensive treatment.

Third, PDC admissions were primarily for individuals diagnosed with neurotic, stress-related, or somatoform disorders followed by affective disorders. Individuals with such diagnoses are believed to be those most helped by PDCs, given that

day clinic services are offered in an environment similar to the pre-trial detainee's current living situation with a focus on developing coping skills (38). The findings of the present study suggest that individuals admitted to the PDC differ systematically from those who are admitted to a psychiatric hospital (i.e., mainly detainees with schizophrenia spectrum disorders), suggesting a unique subgroup of pre-trial detainees who benefit from treatment but are not typically transferred for inpatient hospital treatment. In this context, it may be of specific interest to service planners that there appears to be only a very small group of pre-trial detainees with chronic psychotic illnesses who are too unwell to gain maximum benefit from primary psychiatric care but not so unwell to warrant transfer to an external hospital. This may indicate that mild crises which are manageable in an institution such as the PDC are rare amongst individuals with psychotic illnesses.

None of the female pre-trial detainees, however, were exclusively treated in the PDC but were (additionally) admitted to psychiatric hospitals, suggesting that the treatment services available in the day clinic were judged as not sufficient to meet their healthcare needs. One reason for this may be a higher burden of severe mental disorders amongst female offenders compared to male offenders (68, 69), making them in need of the acute crisis care provided in psychiatric hospitals. That said, it is also possible that mental healthcare simply represents one of many areas of the criminal justice system in need of gender-responsive adaptations to produce the most positive outcomes for women offenders (70).

In summary, the establishment of the PDC provides an innovative path to improve mental health care in pre-trial detention. Not only has the spectrum of provided interventions been expanded, but it also addressed a specific group of pre-trial detainees for which adequate treatment previously seemed unavailable. In addition, the new service has a positive effect on the prison system, due to the PDC being embedded within the existing correctional system: Transfer to the PDC and back to custody is easier, more immediate, and requires fewer resources than external services, and it also improves the continuity and immediacy of mental health care.

Limitations

There are four principal limitations of the present investigation. First, psychiatric hospital admission rates for pre-trial detainees as well as group differences between pre-trial detainees treated only in the PDC vs. in a psychiatric hospital were evaluated only 18 months after the PDC began operating. This relatively short observation period, in which a small sample of only 57 pre-trial detainees were admitted to the new clinic, necessitate viewing the findings of the present study as preliminary and in need of future replication.

Second, it was not possible to explore the reasons why pre-trial detainees of the PDC were also admitted to a psychiatric hospital, as the file records which were reviewed as part of this study lacked information about the course of treatment. Thus, we were not able to identify the reason for additional treatment, i.e., if pre-trial detainees were truly misplaced in the PDC or if placement in the PDC was chosen intermediately due to the lack of available beds in a psychiatric hospital. Hence, it is possible that different reasons for admission could be a moderating factor for the identified rate or group differences, making it important that future research collect and subsequently incorporate such information into analyses.

Third, prevalence rates of mental disorders were calculated on the basis of primary psychiatric care consultations, psychiatric hospital admissions, as well as PDC admissions. Thus, the collected data demonstrates the prevalence of mental disorders among individuals in correctional settings who are in need of acute treatment. Hence, the data may not accurately convey the true prevalence of mental disorders in the prison population of the Canton of Zurich. Due to the lack of standardized diagnostic assessment at time of prison admission, this information is yet not available in the Canton Zurich.

Fourth, minority ethnic groups are overrepresented in prisons world-wide and there is some evidence that this group has restricted access to healthcare in custody. Unfortunately, we had no access to valid information on ethnicity or racial identity, as nationality was the only variable recorded in the analyzed data. However, we do not consider nationality to be a valid representation of ethnicity or racial identity as, e.g., former immigrants with current Swiss nationality may still identify with a different ethnicity or racial identity or are still perceived to have a different racial identity.

Conclusion and practical implications

Empirically exploring innovations in mental healthcare is critical to the welfare of our communities, and this is particularly true for justice-involved persons, who are particularly at risk for developing a mental disorder. The current article presented the findings of the first research investigation of a total cohort of justice-involved persons in Switzerland undergoing different forms of psychiatric care. The findings suggest that the need for evidence-based mental healthcare services is higher in pre-trial detention settings relative to prison settings. To meet this need, an on-site PDC serving pre-trial detainees was found to complement primary psychiatric care services and psychiatric hospital admissions. The PDC appears to be especially beneficial for pre-trial detainees diagnosed with adjustment, stress, anxiety, and affective disorders for who primary psychiatric care alone is not always sufficient but for

who hospital admission may be excessive. Our preliminary data does not support the admission of pre-trial detainees diagnosed with schizophrenia spectrum disorders to the PDC, and the clinic's services need to be improved for women pre-trial detainees, as they have not benefitted from the new site yet.

Data availability statement

The anonymized raw data supporting the conclusions of this article will be made be available by request to the corresponding author.

Ethics statement

The Ethics Committee of the Canton of Zurich waived ethics approval for the present study (Req-2021-00290), as it is not subject to Human Research Act. The use of file data for the current study was approved by the data protection officer of the OCR. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

JG, JE, MW, and AR designed the study. JG and MW prepared the data. Supervised by JG and AR, MW performed the statistical analyses. JG took the lead in writing the manuscript in close collaboration with JE, AR, MW, MG, and JS. All authors provided critical feedback and helped shape analyses and interpretation. All authors contributed to the article and approved the submitted version.

Acknowledgments

We thank the Head of Pre-Trial Detention of the Canton of Zurich, Roland Zurkirchen; the Head and Deputy Head of the Pre-Trial Detention Center Limmattal, which holds the PDC, Daniel Bosshart and Jan Streitberg; and the Head of Nursing Staff of the PDC, Silke Roth-Meister for providing invaluable insight into the concept and work of the PDC. We also thank the Head of the Department of Mental Health Services (DHMS) of the OCR, Matthias Stürm, and the Head of the DMHS's controlling division, Karin Garcia, for providing both the data and administrative assistance in the data preparation. We thank Valerie Profes for supporting data preparation. We also thank biosciencewriters.com for language editing services.

Conflict of interest

JS was employed by Publication Academy Inc.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

1. Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H. et al. Vollebergh Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatrica Scandinavica.* (2004) 109:21–7. doi: 10.1111/j.1600-0047.2004.00327.x

2. Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V, et al. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980–2013. *Int J Epidemiol.* (2014) 43:476–93. doi: 10.1093/ije/dyu038

3. World Health Organization. *Psychische Gesundheit – Faktenblatt*. (2019). Copenhagen: WHO Regional Office for Europe. Available online at: https://www.euro.who.int/__data/assets/pdf_file/0006/404853/MNH_FactSheet_DE.pdf (accessed March 31, 2022).

4. Baranyi G, Scholl C, Fazel S, Patel V, Priebe S, Mundt AP. Severe mental illness and substance use disorders in prisoners in low-income and middle-income countries: a systematic review and meta-analysis of prevalence studies. *Lancet Global Health.* (2019) 7:e461–71. doi: 10.1016/S2214-109X(18)30539-4

5. Fazel S, Seewald K. Severe mental illness in 33 588 prisoners worldwide: systematic review and meta-regression analysis. *Br J Psychiatry.* (2012) 200:364–73. doi: 10.1192/bjp.bp.111.096370

6. Fazel S, Yoon IA, Hayes AJ. Substance use disorders in prisoners: an updated systematic review and meta-regression analysis in recently incarcerated men and women. *Addiction.* (2017) 112:1725–39. doi: 10.1111/add.13877

7. Fazel S, Bains P, Doll H. Substance abuse and dependence in prisoners: a systematic review. *Addiction.* (2006) 101:181–91. doi: 10.1111/j.1360-0443.2006.01316.x

8. Jacobi F, Höfler M, Strehle J, Mack S, Gerschler A, Scholl L, et al. Psychische Störungen in der Allgemeinbevölkerung. *Nervenarzt.* (2014) 85:77–87. doi: 10.1007/s00115-013-3961-y

9. Fazel S, Danesh J. Serious mental disorder in 23 000 prisoners: a systematicm review of 62 surveys. *Lancet.* (2002) 359:545–50. doi: 10.1016/S0140-6736(02)07740-1

10. Volkert J, Gablonski T-C, Rabung S. Prevalence of personality disorders in the general adult population in Western countries: systematic review and meta-analysis. *Br J Psychiatry.* (2018) 213:709–15. doi: 10.1192/bjp.2018.202

11. Simeone JC, Ward AJ, Rotella P, Collins J, Windisch R. An evaluation of variation in published estimates of schizophrenia prevalence from 1990– 2013: a systematic literature review. *BMC Psychiatry.* (2015) 15:1–14. doi: 10.1186/s12888-015-0578-7

12. Ferrari A, Somerville A, Baxter A, Norman R, Patten S, Vos T, et al. Global variation in the prevalence and incidence of major depressive disorder: a systematic review of the epidemiological literature. *Psychol Med.* (2013) 43:471–81. doi: 10.1017/S0033291712001511

13. Baggio S, Fructuoso A, Guimaraes M, Fois E, Golay D, Heller P, et al. Prevalence of attention deficit hyperactivity disorder in detention settings: a systematic review and meta-analysis. *Front Psychiatry.* (2018) 9:331. doi: 10.3389/fpsyt.2018.00331

14. Young S, Sedgwick O, Fridman M, Gudjonsson G, Hodgkins P, Lantigua M, et al. Co-morbid psychiatric disorders among incarcerated ADHD populations: a meta-analysis. *Psychol Med.* (2015) 45:2499–510. doi: 10.1017/S0033291715000598

15. Augsburger A, Neri C, Bodenmann P, Gravier B, Jaquier V, Clair C. Assessing incarcerated women's physical and mental health status and needs in a Swiss prison: a cross-sectional study. *Health Justice.* (2022) 10:8. doi: 10.1186/s40352-022-00171-z

16. Bessler C, Stiefel D, Barra S, Plattner B, Aebi M. Psychische Störungen und kriminelle Rückfälle bei männlichen jugendlichen Gefängnisinsassen. *Z Kinder Jugendpsychiatr Psychother.* (2019) 47:73–88. doi: 10.1024/1422-4917/a000612

17. Eytan A, Haller DM, Wolff H, Cerutti B, Sebo P, Bertrand D, et al. Psychiatric symptoms, psychological distress and somatic comorbidity among remand prisoners in Switzerland. *Int J Law Psychiatry.* (2011) 34:13–9. doi: 10.1016/j.ijlp.2010.11.003

18. Gisin D, Haller DM, Cerutti B, Wolff H, Bertrand D, Sebo P, et al. Mental health of young offenders in Switzerland: Recognizing psychiatric symptoms during detention. *J Forensic Leg Med.* (2012) 19:332–6. doi: 10.1016/j.jflm.2012.02.013

19. Haller DM, Sebo P, Cerutti B, Bertrand D, Eytan A, Niveau G, et al. Primary care services provided to adolescents in detention: a cross-sectional study using ICPC-2. *Acta Paediatr.* (2010) 99:1060–4. doi: 10.1111/j.1651-2227.2010.01716.x

20. Heller P, Morosan L, Badoud D, Laubscher M, Jimenez Olariaga L, Debbané M, et al. Prevalence rates and evolution of psychiatric disorders among incarcerated youths in comparison with non-incarcerated youths. *Front Psychiatry*. (2022) 12:784954. doi: 10.3389/fpsyt.2021.784954

21. Krammer S, Eisenbarth H, Fallegger C, Liebrenz M, Klecha D. Sociodemographic information, aversive and traumatic events, offence-related characteristics, and mental health of delinquent women in forensic-psychiatric care in Switzerland. *Int J Offender Ther Comp Criminol.* (2017) 62:3815–33. doi: 10.1177/0306624X17749638

22. Krammer S, Eisenbarth H, Hugli D, Liebrenz M, Kuwert P. The relationship between childhood traumatic events, social support, and mental health problems in prisoners. *J Forensic Psychiatry Psychol.* (2018) 29:72–85. doi: 10.1080/14789949.2017.1337802

23. Krammer S, Maercker A, Holtforth MG, Gamma A, Liebrenz M. Die posttraumatische Belastungsstörung (PTBS) nach dem ICD-11 Kriterienvorschlag bei inhaftierten Männern. *Fortschritte der Neurologie Psychiatrie.* (2019) 87:112–20. doi: 10.1055/s-0044-101545

24. Moschetti K, Stadelmann P, Wangmo T, Holly A, Bodenmann P, Wasserfallen J-B, et al. Disease profiles of detainees in the Canton of Vaud in Switzerland: gender and age differences in substance abuse, mental health and chronic health conditions. *BMC Public Health.* (2015) 15:872. doi: 10.1186/s12889-015-2211-6

25. Urbaniok F, Endrass J, Noll T, Vetter S, Rossegger A. Posttraumatic stress disorder in a Swiss offender population. *Swiss Med Wkly.* (2007) 137:151–6. doi: 10.4414/smw.2007.11518

26. Wolff H, Sebo P, Haller DM, Eytan A, Niveau G, Bertrand D, et al. Health problems among detainees in Switzerland. *BMC Public Health.* (2011) 11:245. doi: 10.1186/1471-2458-11-245

27. World Health Organization. *International Classification of Diseases and Related Health Problems, 10th Revision*. Geneva, Switzerland: World Health Organization (1994).

28. Okkes I, Jamoulle M, Lamberts H, Bentzen N. ICPC-2-E: the electronic version of ICPC-2. Differences from the printed version and the consequences. *Family Pract.* (2000) 17:101–7. doi: 10.1093/fampra/17.2.101

29. Maercker A, Schützwohl M. Erfassung von psychischen Belastungsfolgen: Die impact of event skala-revidierte version (IES-R). *Diagnostica.* (1998) 44:130–41. doi: 10.1037/t55092-000

30. Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P, et al. Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): initial reliability and validity data. *J Am Acad Child Adolesc Psychiatry.* (1997) 36:980–8. doi: 10.1097/00004583-199707000-00021

31. Franke GH, Derogatis LR. *Symptom-Checkliste von L. R. Derogatis: SCL-90-R [German version]*. Göttingen: Beltz Test (2002).

32. UNODC. *The United Nations Standard Minimum Rules for the Treatment of Prisoners*. Vienna: United Nations Office on Drugs and Crime (2015). Available online at: https://www.unodc.org/documents/justice-and-prison-reform/Nelson_Mandela_Rules-E-ebook.pdf

33. Council of Europe. *Recommendation Rec(2006)2-rev of the Committee of Ministers to member States on the European Prison Rules*. Strasbourg: Committee of Ministers of the Council of Europe (2020. Available online at: https://rm.coe.int/09000016809ee581 (accessed April 7, 2022).

34. SKJV. *Handbuch psychiatrische Versorgung im Freiheitsentzug*. Fribourg: Schweizerisches Kompetenzzentrum für den Justizvollzug SKJV (2021). Available online at: https://www.skjv.ch/sites/default/files/documents/Psychiatrische_Versorgung_Handbuch.pdf (accessed April 7, 2022).

35. Heekeren K. Tageskliniken. In: Rössler W, Kawohl W, editors. *Soziale Psychiatrie: Das Handbuch für die psychosoziale Praxis - Band 2*. Stuttgart: Kohlhammer (2013).

36. Hopf H, Diebels E. Merkmale und Praxis psychiatrischer Tageskliniken in Deutschland. *Psychiatr Prax.* (2017) 44:228–33. doi: 10.1055/s-0042-115846

37. Schene AH. Day hospitals and partial hospitalization programmes. In: Thornicroft G, Szmukler G, Mueser KT, editors. *Oxford Textbook of Community Mental Health*. New York, NY: Oxford University Press (2011), 154–160.

38. Heekeren K, Antoniadis S, Habermeyer B, Obermann C, Kirschner M, Seifritz E, et al. Psychiatric acute day hospital as an alternative to inpatient treatment. *Front Psychiatry.* (2020) 11:471. doi: 10.3389/fpsyt.2020.00471

39. Kallert TW, Priebe S, McCabe R, Kiejna A, Rymaszewska J, Nawka P, et al. Are day hospitals effective for acutely ill psychiatric patients? A European multicenter randomized controlled trial. *J Clin Psychiatry.* (2007) 68:278–87. doi: 10.4088/JCP.v68n0214

40. Marshall M, Crowther R, Sledge WH, Rathbone J, Soares-Weiser K. Day hospital versus admission for acute psychiatric disorders. *Cochrane Database Syst Rev.* (2011) 2011:CD004026. doi: 10.1002/14651858.CD004026.pub2

41. Larivière N, Desrosiers J, Tousignant M, Boyer R. Who benefits the most from psychiatric day hospitals? A comparison of three clinical groups. *J Psychiatr Pract.* (2010) 16:93–102. doi: 10.1097/01.pra.0000369970.87779.ca

42. Marshall M, Crowther R, Almaraz-Serrano A, Creed F, Sledge W, Kluiter H, et al. Day hospital versus admission for acute psychiatric disorders (a systematic review of individual patient data). *Cochrane Database Syst Rev.* (2003) CD004026. doi: 10.1002/14651858.CD004026

43. Schulte-Ostermann MA, Huchzermeier C. Gefängnispsychiatrie zwischen Bedarf und Wirklichkeit: Die psychiatrische Tagesklinik in der JVA Neumünster. *RPsych Rechtspsychologie.* (2019) 5:42–60. doi: 10.5771/2365-1083-2019-1-42

44. van Marle H. Forensic psychiatric services in the Netherlands. *Int J Law Psychiatry.* (2000) 23:515–31. doi: 10.1016/S0160-2527(00)00049-2

45. Gabrysch C, Fritsch R, Priebe S, Mundt AP. Mental disorders and mental health symptoms during imprisonment: a three-year follow-up study. *PLoS ONE.* (2019) 14:e0213711. doi: 10.1371/journal.pone.0213711

46. Harvey J. Crossing the boundary: the transition of young adults into prison. In: Liebling A, Maruna S, editors. *The Effects of Imprisonment*. Abingdon, UK: Willan (2005), 232–254.

47. May DC, Applegate BK, Ruddell R, Wood PB. Going to jail sucks (and it really doesn't matter who you ask). *Am J Crim Just.* (2014) 39:250–66. doi: 10.1007/s12103-013-9215-5

48. Forrester A, Singh J, Slade K, Exworthy T, Sen P. Mental health in-reach in an urban UK remand prison. *Int J Prison Health.* (2014) 10:155–63. doi: 10.1108/IJPH-07-2013-0035

49. James DJ, Glaze LE. *Mental Health Problems of Prison and Jail Inmates*. Washington, D.C.: U.S. Department of Justice, Office of Justice Programs (2016). Available online at: https://biblioteca.cejamericas.org/bitstream/handle/2015/2829/Mental_Health_Problems_Prison_Jail_Inmates.pdf?sequence=1&isAllowed=y (accessed April 7, 2022).

50. Fazel S, Cartwright J, Norman-Nott A, Hawton K. Suicide in prisoners: a systematic review of risk factors. *J Clin Psychiatry.* (2008) 69:20444. doi: 10.4088/JCP.v69n1107

51. Opitz-Welke A, Bennefeld-Kersten K, Konrad N, Welke J. Prison suicides in Germany from 2000 to 2011. *Int J Law Psychiatry.* (2013) 36:386–9. doi: 10.1016/j.ijlp.2013.06.018

52. FSO. *Assistierter Suizid nach Geschlecht und Alter*. Neuchâtel, Switzerland: Federal Statistical Office (2021). Available online at: https://www.bfs.admin.ch/bfs/en/home/statistics/catalogues-databases/tables.assetdetail.19444412.html (accessed March 25, 2022).

53. FSO. *Imprisonment, Deaths and Suicides*. Neuchâtel, Switzerland: Federal Statistical Office (2021). Available online at: https://www.bfs.admin.ch/bfs/de/home/aktuell/neue-veroeffentlichungen.assetdetail.16764817.html (accessed March 25, 2022).

54. FSO. *Imprisonment, Prison population on reference day*. Neuchâtel, Switzerland: Federal Statistical Office (2021). Available online at: https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken.assetdetail.16764834.html (accessed March 25, 2022).

55. FSO. *Population*. Neuchâtel, Switzerland: Swiss Federal Statistical Office (2021). Available online at: https://www.bfs.admin.ch/bfs/en/home/statistics/population/effectif-change/population.html (accessed March 25, 2022).

56. FSO. *Suicide Rate - Deaths by Suicide per 100 000 Population*. Neuchâtel, Switzerland: Federal Statistical Office (2021). Available online at: https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.19804051.html (accessed March 25, 2022).

57. Canton of Zurich. *Eröffnung der Kriseninterventionsabteilung (KIA) im Gefängnis Limmattal – Verbesserungen für Häftlinge in Untersuchungshaft*. Zurich: Office of Corrections (2019). Available online at: https://www.zh.ch/de/news-uebersicht/medienmitteilungen/2019/03/eroeffnung-der-kriseninterventionsabteilung-kia-im-gefaengnis.html (accessed March 30, 2022).

58. Bosshart D, Streitberg J, Roth S. *Kriseninterventionsabteilung (KIA) im Gefängnis Limmattal. Unpublished concept paper, version 3.0, 7 Feb, 2019*. Zurich: Office of Corrections (2019).

59. Head of the PDC. [Personal communication] (2020).

60. Canton Basel-Stadt. *Untersuchungsgefängnis [German]*. Basle: Office of Corrections, Canton Basel-Stadt (n.d.). Available online at: https://www.bdm.bs.ch/Ueber-uns/Organisation/Amt-fuer-Justizvollzug/Untersuchungsgefaengnis.html (accessed April 4, 2022).

61. Canton of Bern. *Forensische Tagesklinik im Regionalgefängnis Burgdorf*. Bern: Psychiatric Services of the University of Bern (2022). Available online at: https://www.upd.ch/de/angebot/forensik/FTK-im-RGBU.php (accessed April 4, 2022).

62. JuWe. About Us (2022). Available online at: https://www.zh.ch/en/direktion-der-justiz-und-des-innern/justizvollzug-wiedereingliederung.html (accessed March 20, 2022).

63. Zurkirchen R, Tobler S. Im Spannungsfeld zwischen Gesetzesauftrag und Normalisierung des Gefängnisalltags. *Schweizerische Zeitschrift Für Kriminologie, Sondernummer: 20 Jahre Amt für Justizvollzug Zürich – eine Festschrift*. (2019). p. 78–89.

64. Swiss Criminal Code (2022). Available online at: https://www.fedlex.admin.ch/eli/cc/54/757_781_799/en (accessed March 30, 2022).

65. StataCorp. *Stata Statistical Software: Release 16*. College Station, TX: StataCorp LLC (2019).

66. Di Lorito C, V?llm B, Dening T. Psychiatric disorders among older prisoners: a systematic review and comparison study against older people in the community. *Aging Ment Health*. (2018) 22:1–10. doi: 10.1080/13607863.2017.1286453

67. Fazel S, Hayes AJ, Bartellas K, Clerici M, Trestman R. Mental health of prisoners: prevalence, adverse outcomes, and interventions. *Lancet Psychiatry*. (2016) 3:871–81. doi: 10.1016/S2215-0366(16)30142-0

68. Coolidge FL, Marle PD, Van Horn SA, Segal DL. Clinical syndromes, personality disorders, and neurocognitive differences in male and female inmates. *Behav Sci Law*. (2011) 29:741–51. doi: 10.1002/bsl.997

69. Rossegger A, Wetli N, Urbaniok F, Elbert T, Cortoni F, Endrass J. Women convicted for violent offenses: adverse childhood experiences, low level of education and poor mental health. *BMC Psychiatry*. (2009) 9:81. doi: 10.1186/1471-244X-9-81

70. Wright EM, Van Voorhis P, Salisbury EJ, Bauman A. Gender-responsive lessons learned and policy implications for women in prison: a review. *Crim Justice Behav*. (2012) 39:1612–32. doi: 10.1177/0093854812451088

frontiers | Frontiers in Psychiatry

TYPE Original Research
PUBLISHED 07 September 2022
DOI 10.3389/fpsyt.2022.961549

OPEN ACCESS

EDITED BY
Birgit Angela Völlm,
University of Rostock, Germany

REVIEWED BY
Shreedhar Acharya,
Northern Ontario School of Medicine, Canada
Meldon Kahan,
Women's College Hospital, Canada

*CORRESPONDENCE
Alexander Voulgaris
a.voulgaris@uke.de

SPECIALTY SECTION
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

RECEIVED 04 June 2022
ACCEPTED 18 August 2022
PUBLISHED 07 September 2022

CITATION
Reiners S, Opitz-Welke A, Konrad N and Voulgaris A (2022) Availability of opioid agonist treatment and critical incidents in Forensic Clinics for Dependency Diseases in Germany. *Front. Psychiatry* 13:961549. doi: 10.3389/fpsyt.2022.961549

Availability of opioid agonist treatment and critical incidents in Forensic Clinics for Dependency Diseases in Germany

Sven Reiners[1], Annette Opitz-Welke[2,3], Norbert Konrad[2,3] and Alexander Voulgaris[4]*

[1]Krankenhaus des Maßregelvollzuges Berlin, Forensic Psychiatric Hospital Berlin, Berlin, Germany, [2]Institute of Forensic Psychiatry, Charité-Universitätsmedizin Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Berlin, Germany, [3]Department of Psychiatry and Psychotherapy, Prison Hospital Berlin, Berlin, Germany, [4]Institute of Sex Research, Sexual Medicine and Forensic Psychiatry, Universitätsklinikum Hamburg-Eppendorf, Hamburg, Germany

Background: Prevalence of substance use disorders, especially opioid use disorders, is high in patients admitted into forensic psychiatric settings. Opioid agonist treatment is a safe, well-established, and effective treatment option for patients that suffer from opioid dependence. Surprisingly, data on the availability and practice of opioid agonist treatment (OAT) options in German Forensic Clinics for Dependency Diseases is rare. Furthermore, essential data on the prevalence of critical incidents such as violent behavior, relapse, or escape from the clinic are missing for this particular treatment setting.

Materials and methods: We conducted an observational study on all forensic addiction treatment units in Germany (Sect. 64 of the German Criminal Code). A questionnaire on the availability and practice of OAT was sent to all Forensic Clinics for Dependency Diseases in Germany. Following items were assessed: availability and the total number of patients that received an OAT in 2018, available medication options, specific reasons for start and end of OAT, number of treatments terminated without success, number of successful treatments, and critical incidents such as violent behavior, relapse, escape and reoffending. We compared the forensic clinics that offered OAT with those that did not offer this treatment option. The data were analyzed descriptively. Mean and standard deviation was calculated for metric scaled variables. For categorical variables, absolute and relative frequencies were calculated. The two groups (OAT vs. Non-OAT institutions) were compared concerning the given variables by either using Fishers exact test (categorical variables), *t*-test (normally distributed metric variables), or Wilcoxon-test (metric variables not normally distributed).

Results: In total, 15 of 46 Forensic Clinics for Dependency Diseases participated in the study (33%). In total, 2,483 patients were treated in the participating clinics, 18% were relocated into prison due to treatment termination, and 15% were discharged successfully in 2018. 275 critical incidents were reported: violence against a patient (4%), violence against staff (1.6%), escape (4.7%) and reoffending in (0.5%). In seven clinics treating

10.3389/fpsyt.2022.961549

1,153 patients, an OAT was available. OAT options in forensic clinics were buprenorphine/naloxone, buprenorphine, methadone, and levomethadone. Regarding critical incidents and successful discharge, no differences were detected in the clinics with or without an OAT. In the clinics that offered an OAT, we found a significantly higher rate of treatment termination without success ($p < 0.007$) in comparison to clinics without an OAT program. Ninety-nine patients received an OAT, and this treatment was ended due to illegal drug abuse (57%), refusal to give a urine drug sample (71%), and cases where the OAT was given away to other patients (85%).

Conclusion: In Forensic Clinics for Dependency Diseases in Germany, OAT is not available in every institution, and thus, access is limited. Critical incidents such as violent behavior against staff or patients and escape are not uncommon in these forensic treatment settings. Further studies are needed to enhance the understanding of OAT practice and the risks for patients and staff.

KEYWORDS

opioid agonist treatment, critical incidents, escape, violent behavior, forensic psychiatry

Introduction

Addiction therapy in forensic clinics for dependency disorders (FCDD) is an ongoing controversial topic of discussion regarding the necessity, quality of care, effectiveness, and mode of implementation in Germany (1–4). It is known that substance abuse disorders are highly prevalent in forensic psychiatric and prison contexts and play an essential role in crime, the risk for reoffending, violent behavior, and mental disorders (5–7).

While comprehensive data describing differences in forensic psychiatric care, admission numbers over time, and legal frameworks in European countries (8–10) exist, data on specific FCDD or available treatment options for (comorbid) substance abuse disorders in forensic psychiatry are lacking on a national and on an international level (11, 12). After 30 years of deinstitutionalization with a reduction of general psychiatric bed capacity, a trend toward reinstitutionalization with higher admission rates into forensic psychiatric care is evident (13). In this aspect, higher rates of comorbid substance misuse are discussed as one potential reason for this development (8).

In Germany, specialized psychiatric-psychotherapeutic care is offered in FCDD to offenders that committed a crime in combination with a substance use disorder. These FCDD are typically separated from general forensic psychiatric care, and bed capacity in FCDD in Germany is continuously rising, with 1,230 patients in the year 1994 and 4,500 patients in treatment in the year 2021 (2, 14–16). The rationale for these specific treatment institutions is that some committed crimes are supposedly connected to an individual substance use disorder and by offering an intensive treatment possibility for these patients, in theory, the risk for relapse and re-incarceration after release can be diminished. Studies suggest that successful treatment participation is associated with higher rates of abstinence and fewer criminal relapses (3). But, it is important to note that studies repeatedly described a rate of about 50% when it comes to unsuccessful treatment termination in FCDD (2, 17). Unsuccessful treatment termination leads to a transfer into general prison facilities, where OAT is (often) available, but specific psychotherapeutic interventions or group therapy is lacking. These developments underline the importance of intensifying research activities to understand better what happens in these specific forensic treatment settings.

The World Health Organization (WHO) and the German Society for Addiction Medicine are clear when recommending opioid agonist treatment (OAT) as a first-line, practical, and evidence-based treatment option for opioid addiction with a positive influence on mortality, drug use, and treatment compliance (18–24). Still, to the best of our knowledge, it is unknown to what extent opioid agonist treatment is available to the patients treated in FCDD nationwide.

As stated above, successful treatment of substance use disorders may positively influence the risk for dangerous and impulsive patient behavior. In FCDD, all patients admitted are diagnosed with at least one moderate to severe substance use disorder. Thus, information on critical incidents such as violent behavior or escape/absconding during treatment is a relevant to better understand what patients and personnel experience during the process and what they must cope with in this specific forensic treatment setting.

Aims of our study

We aimed to describe the availability and clinical practice of OAT in FCDD nationwide. Due to our clinical experience in the field, we hypothesized that OAT availability and implementation would be largely heterogeneous in Germany. The leading author SR was the chief doctor of the FCDD in Berlin, Germany, so general information on OAT options in FCDD was available to some extent. The lack of scientific data on this relevant topic (12) in forensic psychiatric care is well-known in Germany and with this in mind, this study was conducted. In addition, we were interested in the frequency and typology of specific critical incidents during treatment episodes and the discharge mode in the FCDD in the year 2018.

Materials and methods

Study setting

In German law, under specific circumstances, courts can apply a dependency treatment order to offenders who suffer from a substance use disorder and commit an unlawful act (Section 64 German criminal code). Preconditions for this treatment order are offenses above a certain threshold and a direct or indirect connection to the offender's substance use disorder (e.g., intoxication, offense to finance the substance abuse). During the trial, the judge orders an expert witness with particular expertise in forensic psychiatry to report on the diagnosis and the legal and treatment prognosis regarding specialized therapy in an FCDD. Only patients with a favorable treatment prognosis should enter therapy in the FCDD, with an average length of stay of 2 years.

Study design

We conducted an observational study including all FCDD in Germany for 2018. *Via* postal survey, all chief doctors of the existing 46 FCDD in Germany were contacted and invited to participate in our study and received the questionnaire. It is important to note that the questionnaire was anonymous in nature. This means that survey responders and their institution were kept anonymous and thus, no data regarding the specific location of the FCDD was attained. This was decided in order to ensure a high participation rate. After 3 months, follow-up letters were sent *via* email to increase the response rate. How the chief doctors generated the specific information in their FCDD was not asked for. It is common in Germany, that FCDD have their own administrative database systems with which the questionnaire can be completed.

Questionnaire information

The questionnaire was two pages long and asked for 13 items. Items included detailed information regarding the clinical practice with OAT in the local FCDD, such as availability, year of availability and total number of patients that received an OAT in 2018, available medication options for OAT, specific reasons for starting and ending an OAT, total number of treatment terminations without success, number of successful treatments and the total number of critical incidents such as violent behavior against staff, violent behavior against other patients, drug or alcohol relapse, escape from the clinic, escape during relaxation of security measures, and occurrence of a new offense during ongoing treatment. Information on diagnosis was classified using the International Classification of Diseases ICD-10.

Statistical analyzes

The data were analyzed descriptively. Mean and standard deviation was calculated for metric scaled variables. For categorical variables, absolute and relative frequencies were calculated. The two groups (FCDD with OAT vs. FCDD without OAT) were compared concerning the given variables by either using Fishers exact test (categorical variables), *t*-test (normally distributed metric variables), or Wilcoxon-test (metric variables not normally distributed). For all analyzes, $p < 0.05$ was considered significant. We performed all analyzes using IBM SPSS Statistics, version 25.0.

Results

In total, 15 of the available 46 FCDD in Germany participated in our survey (33%). Due to the anonymity of the study, there was no information regarding which FCDD participated or in how far they differed from the FCDD that did not respond. The participating FCDD treated 2,483 patients in 2018. Of these, 444 (18%) patients were relocated into prison due to treatment termination, and 379 (15%) were discharged

TABLE 1 Reported critical incidents in Forensic Clinics for Dependency Diseases in Germany in 2018.

Critical incidents	Total
Violent behavior against another patient	103 (37.45%)
Violent behavior against staff	39 (14.18%)
Offense during relaxation of security measures	12 (4.36%)
Escape during relaxation of security measures	118 (42.90%)
Escape from the clinic	3 (1.09%)
Total	275 (100%)

after completing the treatment program. Critical incidents were reported in 275 cases (see Table 1).

In seven of the 15 participating FCDD (47%), an OAT program was available. In these seven FCDD, 1,153 patients were treated during 2018. Regarding specific characteristics and medical OAT options, see Table 2.

In all seven FCDDs offering an OAT program, patients were included with an existing diagnosis of opioid substance addiction (ICD-10 F11.2) and also in combination with other comorbid substance addiction disorders (ICD-10: F1X.2) or due to the diagnoses of a polyvalent substance use disorder (ICD-10: F19.2). All seven FCDD with an OAT program started or continued an OAT when the patient had already received an OAT before admission to the FCDD. Four of the seven FCDDs offered to start a new OAT after the initial diagnostic phase of the treatment process. Moreover, two of the seven FCDDs offered to start an OAT at the end of the treatment process when security measures were loosened.

The OAT program ended due to the following reasons. In four FCDDs, the OAT was ended due to illegal drug or opioid abuse (57%), in five FCDDs due to the refusal to give a urine drug sample (71%), and in six FCDDs due to cases where the OAT was given away to other patients (85%). Low patient compliance during the treatment process was a reason for one of the FCDDs. For more detailed information concerning the reasons for OAT termination, see Table 3.

We formed subgroups and compared the FCDD with and without an established OAT program regarding critical incidents and discharge mode. In successful treatment, no differences were detected in the clinics with or without an OAT program. In the clinics that offered an OAT, we detected a significantly higher rate of treatment termination without success ($p < 0.007$) in comparison to clinics without an OAT program (see Table 4).

In the seven FCDD offering OAT in 2018, 99 patients were included in the OAT program (8.5%). Of these, 25 were relocated into prison due to treatment termination, and in nine cases, successful treatment progress was reported. Including all participating FCDD of our study, merely 3.9% of all 2,483 patients received an OAT.

Discussion

Although merely 33% of FCDD responded to our postal survey, 2,483 patients were included in the study, and thus more than 50% of all patients treated in FCDD in Germany in 2018 were represented in our sample (2). Of 823 patients that ended the therapy in 2018, 53% were relocated to prison, which aligns with the published data on unsuccessful treatments (2, 17). As expected, variability in the clinical practice regarding OAT is high and availability relatively low in FCDD in Germany. Only seven out of 15 FCDD offered an OAT program, and merely 8.6% (2.6–21.3%) of patients in these FCDD received an OAT. Berthold and Riedemann demonstrated in a cross-sectional study including 2,046 patients that in the year 2019, 32% of the patients in FCDD had a primary diagnosis of a

TABLE 2 Patient numbers and available OAT options in seven Forensic Clinics for Dependency Diseases in Germany in 2018.

	FCDD 1	FCDD 2	FCDD 3	FCDD 4	FCDD 5	FCDD 6	FCDD 7	Total
Patients total	369	61	152	122	244	111	94	1,153
OAT program (year)	2011	–	2007	2015	2017	2018	2001	
Patients with OAT	34 (9.21%)	13 (21.31%)	4 (2.63%)	13 (10.65%)	13 (5.32%)	20 (18.01%)	2 (2.12%)	99 (8.58%)
- Methadone	+	+	+	+	+	–	–	
- Levomethadone	+	+	+	+	+	+	–	
- Buprenorphine	–	+	+	+	+	+	+	
- Buprenorphine/Naloxone	+	+	–	+	+	–	–	
- Morphine	–	+	–	–	–	–	–	
- Diamorphine	–	–	–	–	–	–	–	

TABLE 3 Clinical practice for ending OAT in the seven Forensic Clinics for Dependency Diseases offering OAT.

	FCDD 1	FCDD 2	FCDD 3	FCDD 4	FCDD 5	FCDD 6	FCDD 7
Illegal opioid abuse	X		X	X	X		
Illegal drug abuse	X		X		X	X	
No urine sample	X		X	X	X	X	
Giving away OAT	X	X	X	X	X	X	
No compliance					X		
Patients decision							X

TABLE 4 Comparison of FCDD with and without an OAT program in 2018 (mean with standard deviation).

	FCDD without OAT	FCDD with OAT	*p* overall
Patients per FCDD	166 (±87)	165 (±107)	0.976
Treatment terminations	20.6 (±16.7)	42.9 (±34.5)	0.160
Successful treatments	28.1 (±13.4)	22.0 (±8.8)	0.310
Violence against patients	9.3 (±8.67)	7.6 (±7.3)	0.723
Violence against staff	3.38 (±4.6)	2.4 (±2.1)	0.613
Escape from clinic	0.38 (±0.74)	0.00 (±0.00)	0.197
Escape during relaxation of security measures	8.75 (±6.43)	8.00 (±12.1)	0.894
Offense during relaxation of security measures	0.38 (±0.74)	1.80 (±2.49)	0.275
Treatment terminations in relation to total treatments	11.0 (±7.37)	25.6 (±9.20)	0.007
Treatment success in relation to total treatments	17.4 (±14.0)	15.8 (±6.75)	0.780

polyvalent substance dependency disorder (ICD-10: F19.2) and 10% had a primary opioid dependency disorder (ICD-10: F11.2). Also, in 2019, 19% experienced an OAT before entering the FCDD (25). This possible under treatment of patients in need of OAT supports the often described "clinic-effect" — the influence of the individual setting and treatment possibilities in each FCDD—and its consequences for treatment outcome (25–27).

In comparison, in Western European and German prison facilities availability of OAT is higher (7, 28), which is surprising given that FCDD are specialized treatment centers for substance use disorders. A possible explanation may be that a common goal in FCDD is often total abstinence of all substances and that an OAT may not be considered a sufficient therapy success (1, 25, 29, 30). In our opinion, the often described positive effects of OAT on general health and recidivism are in stark contrast to the specific practice in FCDD (18–25, 31–39), and standardization of available treatment possibilities is recommended.

Regarding the clinical practice of OAT, only four FCDDs offered a new implementation of OAT after an initial diagnostic phase. In only two FCDDs, an OAT was started at the end of the therapeutic process. In our opinion, this reflects a rather limited access to OAT in general, and also in the FCDD that offer this well-established and, in general practice, common treatment option (18–24). Further, these results are relevant insofar that the literature suggests two critical points in the treatment process where premature terminations are common: at the beginning and at the end of the therapeutic process, where patients are confronted with a stepwise re-entry into society and a loosening of security measures (29). Reasons for ending an OAT during the process also varied between the different FCDDs. Discontinuing OAT due to refusal of providing a urine sample or engagement in illegal drug use are not evidence-based reasons for terminating the OAT, and rather enhances individual risk for relapse, criminal recidivism and overdose symptoms. Note that specific information on the individual therapeutic process and context regarding the discontinuation of the OAT was not recorded in the study. As expected, methadone, levomethadone, and buprenorphine were frequently prescribed as OAT, while morphine was only available in one FCDD, and diamorphine was not prescribed in any of the participating FCDD. To the best of our knowledge, comparable data from other countries are missing.

When comparing the FCDD with and without an OAT program, we detected no differences in the number of critical incidents. In total, escape during stepwise relaxation of security measures was identified in 4.7%, which is lower when compared to available data from 2012 covering the years 2001 through 2009 and analyzing 994 cases in Regensburg, Bavaria, where 15% escaped at least once during the treatment process (40). In his study, Hartl found that 2.5% of the patients demonstrated violent behavior against staff and 6% against other patients and that 6% reoffended during the therapy, which is also higher in comparison to our results. On the one hand, this supports the above-mentioned "clinic effect" and the observation of high heterogeneity between the different FCDD (40). On the other hand, this may result from improved security measures. Although the current numbers are lower than the limited data for the past suggests, critical incidents are still part of clinical reality in forensic psychiatric institutions, and we believe that implementing more differentiated treatment programs such as OAT could lead to a more individualized and thus optimized therapy.

Interestingly, regarding the treatment process, FCDD offering OAT had a significantly higher rate of premature treatment terminations, which was not expected due to the often discussed positive effects of OAT (25, 39). It may be possible that in federal states where FCDD offers OAT, the admission practice is more open regarding patient groups that suffer from especially severe substance use disorders, which may lead to a more complicated treatment process. It is important to note that our data did not ask for the severity of substance use or comorbid mental disorders and did not include

information on the specific reasons for treatment termination. It is relevant to note that we present aggregate rates of all patients in FCDD with different substance use disorders, not only opioid use disorders, so the true association between the availability of an OAT program and its possible (positive) effects on critical incidents or treatment outcome cannot be explained by our data. Future studies could be conducted as cohort studies with a more precise focus on opioid use disorders, their specific rate for critical incidents and with controlling for potentially confounding factors (e.g., comorbid mental or substance use disorders).

In 2009, Schalast formulated that OAT could and should be an appropriate treatment option for patients in FCDD and that certain flexibility is needed for its implementation (41). Thirteen years later, our data suggest that OAT programs are unavailable nationwide in FCDD. Thus, patients treated in FCDD are at a disadvantage compared to patients in general society and even those in prison. More research and consistent data are necessary to better understand the differences in the clinical practice and to optimize treatment options for patients receiving a court order for therapy in FCDD.

Limitations

Several limitations have to be considered when interpreting our findings. No individual sociodemographic data or data on offense type, comorbid mental disorders such as personality disorders, psychosis or affective disorders, the severity of the symptoms, and other medication was available. Also, data on the reasons for the critical incidents and treatment termination was not assessed. The retrospective design may have led to various biases, and the obtained data, in general, did not allow for in-depth statistical analyzes. A larger and more specific sample would be necessary to better understand critical incidents in FCDD because these incidents are still rare. Our results are temporal and cannot explain current treatment options in FCDD.

In our opinion, the presented data is vital in the ongoing discussion about reforming the clinical and legal practice in Germany regarding the criminal code 64 and general addiction treatment in forensic psychiatric settings.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

According to current legal regulations, the study was approved by the local Ethic Committee at Charité–Universitätsmedizin Berlin.

Author contributions

SR, AO-W, AV, and NK designed the study and had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of data analysis. SR collected the data. AV, NK, and AO-W analyzed and interpreted the data. SR and AV wrote the final draft of the manuscript. All authors contributed to the article and approved the submitted version.

Acknowledgments

The authors would like to thank Ulrich Gauger for his methodological advice. We acknowledge support from the German Research Foundation (DFG).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Hartl C, Schlauderer R, Schlögl C, Mache W. How effective is the treatment of substance-addicted offend-ers (§ 64 German Criminal Code)? A comparison between completed and discontinued therapy. *Monatsschr Kriminol.* (2015) 6, 513–26. doi: 10.1515/mks-2015-980603

2. Müller JL, Böcker FM, Eusterschulte B, Koller M, Muysers J, Pollmächer T. Neuregelung des § 64 StGB aus psychiatrischer Sicht—Positionspapier einer Task-Force der DGPPN. [Revision of §64 of the German Penal Code from a psychiatric perspective-Position paper of a task force of the German Association

for Psychiatry, Psychotherapy and Psychosomatics]. *Nervenarzt*. (2021) 92:1155–62. doi: 10.1007/s00115-021-01109-w

3. Radde S, Majic T, Gutwinski S. Abhängigkeitserkrankungen und Suchtbehandlung in Deutschland. In: Müller JL, Koller M, editors. *Reformansätze zur Unterbringung nach § 64 StGB. Der zweischneidige Erfolg der Unterbringung in einer Entziehungsanstalt*. Stuttgart: Kohlhammer Verlag (2020). p. 103–36.

4. Radtke H. Bemerkungen auf der Grundlage der Rechtsprechung. In: Müller JL, Koller M, editors. *Reformansätze zur Unterbringung nach § 64 StGB. Der zweischneidige Erfolg der Unterbringung in einer Entziehungsanstalt*. Kohlhammer Verlag (2020). p. 57–83.

5. Pickard H, Fazel S. Substance abuse as a risk factor for violence in mental illness: some implications for forensic psychiatric practice and clinical ethics. *Curr Opin Psychiatry*. (2013) 26:349–54. doi: 10.1097/YCO.0b013e328361e798

6. World Health Organization. *Health in Prisons. A WHO Guide to the Essentials in Prison Health*. (2007). Available online at: http://www.euro.who.int/:~data/assets/pdf_file/0009/99018/E90174.pdf (accessed May 28, 2022).

7. Von Bernuth K, Seidel P, Krebs J, Lehmann M, Neumann B, Konrad N, et al. Prevalence of opioid dependence and opioid agonist treatment in the Berlin custodial setting: a cross-sectional study. *Front Psychiatry*. (2020) 11:794. doi: 10.3389/fpsyt.2020.00794

8. Gordon H, Lindqvist P. Forensic psychiatry in Europe. *Psychiatr Bull*. (2007) 31:421–4. doi: 10.1192/pb.bp.107.014803

9. Völlm B, Clarke M, Herrando V, Seppänen A, Gosek P, Heitzman J, et al. European Psychiatric Association (EPA) guidance on forensic psychiatry: evidence based assessment and treatment of mentally disordered of-fenders. *Eur Psychiatry*. (2018) 51:58–73. doi: 10.1016/j.eurpsy.2017.12.007

10. Tomlin J, Lega I, Braun P, Kennedy HG, Herrando VT, Barroso R, et al. Forensic mental health in Europe: some key figures. *Soc Psychiatry Psychiatr Epidemiol*. (2021) 56:109–17. doi: 10.1007/s00127-020-01909-6

11. Tomlin J, Walde P, Völlm B. Protocol for the CONNECT study: a national database and prospective follow-up study of forensic mental health patients in Germany. *Front Psychiatry*. (2022) 13:827272. doi: 10.3389/fpsyt.2022.827272

12. Querengässer J, Bezzel A, Hoffmann K, Mache W, Schiffer B. Healthcare research in forensic commitment or poking around in the dark: consensus paper on the necessity for more uniform and better data. *Nervenarzt*. (2017) 88:1292. doi: 10.1007/s00115-017-0432-x

13. Priebe S, Badesconyi A, Fioritti A, Hansson L, Kilian R, Torres-Gonzales F, et al. Reinstitutionalisation in mental health care: comparison of data on service provision from six European countries. *BMJ*. (2005) 330:123–6. doi: 10.1136/bmj.38296.611215.AE

14. Seifert D, Leygraf N. Drug-dependent offenders in executing guidelines results of a cross-section survey. *Nervenarzt*. (1999) 70:450–6. doi: 10.1007/s001150050461

15. Statistisches Bundesamt Strafverfolgung. *Rechtspflege Fachserie 10, Reihe 3*. (1994). Available online at: https://www.destatis.de/DE/Themen/Staat/Justiz-Rechtspflege/Publikationen/Downloads-Strafverfolgung-Strafvollzug/strafverfolgung-2100300207004.pdf?__blob=publicationFile

16. Federal Office for Statistical Services. [Statistisches Bundesamt]. *Data Set on Criminal Prosecution Series 10, Set 3, 2017 [Rechtspflege, Strafverfolgung]*. (2018). Available online at: https://www.destatis.de/GPStatistik/servlets/MCRFileNodeServlet/DEHeft_ deri-vate_00040937/2100300177004.pdf (accessed May 29, 2019).

17. Berthold D, Riedemann C. Are we actually (still) treating the right ones? A retrospective perspective of treatments according § 64 German Penal Law StGB. *Forensische Psychiatr Psychother*. (2018) 25:74–90.

18. World Health Organization. *Guidelines for the Psychosocially Assisted Pharmacological Treatment of Opioid Depend-ence* (2009). Available online at: https://www.who.int/substance_abuse/publications/Opioid_dependence_guidelines.pdf (accessed May 28, 2022).

19. Backmund M, Lüdecke C, Isernhagen K, Walcher S, Tobias R. *Leitlinie der Deutschen Gesellschaft für Suchtmedizin: Therapie der Opiatabhängigkeit -Teil 1: Substitutionsbehandlung*. (2014). Available online: http://www.fernwisser.de/dgs/wp-content/uploads/2018/09/Leitlinien_Substitution_der_DGS-29-01-2014.pdf

20. Ma J, Bao YP, Wang RJ, Su MF, Liu MX, Li JQ, et al. Effects of medication assisted treatment on mortality among opioids users: a systematic review and meta-analysis. *Mol Psychiatry*. (2018) 89:28–51. doi: 10.1038/s41380-018-0094-5

21. Degenhardt L, Larney S, Kimber J, Gisev N, Farrell M, Dobbins T, et al. The impact of opioid substitution therapy on mortality post-release from prison: retrospective data linkage study. *Addiction*. (2014) 109:1306–17. doi: 10.1111/add.12536

22. Pierce M, Bird SM, Hickman M, Marsden J, Dunn G, Jones A, et al. Impact of treatment for opioid dependence on fatal drug-related poisoning: a national cohort study in England. *Addiction*. (2016) 111:298–308. doi: 10.1111/add.13193

23. Mattick RP, Breen C, Kimber J, Davoli M. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database Syst Rev*. (2009) 3:CD002209. doi: 10.1002/14651858

24. Amato L, Davoli MA, Perucci C, Ferri M, Faggiano FP, Mattick R. An overview of systematic reviews of the effective-ness of opiate maintenance therapies: available evidence to inform clinical practice and research. *J Subst Abuse Treat*. (2005) 28:321–9. doi: 10.1016/j.jsat.2005.02.007

25. Berthold D, Riedemann C. Which patients have a sufficiently concrete prospect of treatment success in forensic addiction treatment according to § 64 of the German Penal Code? *Forens Psychiatr Psychol Kriminol*. (2021) 15:169–78. doi: 10.1007/s11757-021-00653-0

26. Schalast N. Ergebnisse der Essener Evaluationsstudie. In: Schalast N, editor. *Straffällige mit Suchtproblemen*. Pabst: Lengerich (2019). p. 29–150.

27. Pollähne H, Kemper A. *Fehleinweisungen in die Entziehungsanstalt (§ 64 StGB) - Ergebnisse einer empirischen Untersuchung zum nordrhein-westfälischen Maßregelvollzug. Bremer Forschungen zur Kriminalpolitik, Bd. 10*. Berlin: LIT Verlag (2007).

28. Sander G, Shirley-Beavan S, Stone K. The Global State of harm reduction in prisons. *J Correct Health Care*. (2019) 25:105–20. doi: 10.1177/1078345819837909

29. Bezzel, A. The good ones into the potty … mission of a forensic admission ward (§ 64 StGB)?. *Forens Psychiatr Psychol Kri-minol*. (2021) 15:368–75. doi: 10.1007/s11757-021-00682-9

30. Uhl A. Heroingestützte Behandlung von Drogenabhängigkeit: Welchen Stellenwert haben die aktuellen Studien? *Sucht*. (2002) 48:312–14. doi: 10.1024/suc.2002.48.4.312

31. Kimber J, Copeland L, Hickman M, Macleod J, McKenzie J, De Angelis D, et al. Survival and cessation in injecting drug users: prospective observational study of outcomes and effect of opiate substitution treatment. *BMJ*. (2010) 341:c3172. doi: 10.1136/bmj.c3172

32. Gowing L, Farrell MF, Bornemann R, Sullivan LE, Ali R. Oral substitution treatment of injecting opioid users for pre-vention of HIV infection. *Cochrane Database Syst Rev*. (2011) 8:CD004145. doi: 10.1002/14651858.CD004145.pub4

33. Lawrinson P, Ali R, Buavirat A, Chiamwongpaet S, Dvoryak S, Habrat B, et al. Key findings from the WHO collaborative study on substitution therapy for opioid dependence and HIV/AIDS. *Addiction*. (2008) 103:1484–92. doi: 10.1111/j.1360-0443.2008.02249.x

34. MacArthur GJ, Minozzi S, Martin N, Vickerman P, Deren S, Bruneau J, et al. Opiate substitution treatment and HIV transmission in people who inject drugs: systematic review and meta-analysis. *BMJ*. (2012) 345:e5945. doi: 10.1136/bmj.e5945

35. White B, Dore GJ, Lloyd AR, Rawlinson WD, Maher L. Opioid substitution therapy protects against hepatitis C virus acquisition in people who inject drugs: the HITS-c study. *Med J Aust*. (2014) 201:326–9. doi: 10.5694/mja13.00153

36. Platt L, Minozzi S, Reed J, Vickerman P, Hagan H, French C, et al. Needle and syringe programmes and opioid substitution therapy for preventing HCV transmission among people who inject drugs: findings from a cochrane review and meta-analysis. *Addiction*. (2018) 113:545–63. doi: 10.1111/add.14012

37. Craine N, Hickman M, Parry JV, Smith J, Walker AM, Russell D, et al. Incidence of hepatitis C in drug injectors: the role of homelessness, opiate substitution treatment, equipment sharing, and community size. *Epidemiol Infect*. (2009) 137:1255–65. doi: 10.1017/S095026880900212X

38. Heilmann M, Scherbaum N. Zur Bedeutung ergänzender medikamentöser Strategien im Maßregelvollzug gem. § 64 StGB. *Forens Psychiatr Psychol Kriminol*. (2015) 9:18–28. doi: 10.1007/s11757-014-0298-8

39. Reuter B, Küfner H. Ergebnisse der Methadonsubstitution in Deutschland—eine qualitative und quantitative Zusammenfassung. *Suchtmedizin*. (2002) 4:31–45.

40. Hartl C. *Wie erfolgreich ist die Behandlung im Maßregelvollzug nach §§ 63 und 64 StGB? Eine Untersuchung anhand verschiedener Erfolgsmaße*. Univ.-Diss. Regensburg (2013).

41. Schalast N. Treating addicted offenders in forensic mental hospitals in Germany (Art. 64 of the penal code): might the rate of treatment failure be reduced by applying specific medications? *Forens Psychiatr Psychol Kriminol*. (2009) 3:294. doi: 10.1007/s11757-009-0017-z

frontiers | Frontiers in Psychiatry

TYPE Original Research
PUBLISHED 20 October 2022
DOI 10.3389/fpsyt.2022.909781

OPEN ACCESS

EDITED BY
Birgit Angela Völlm,
University of Rostock, Germany

REVIEWED BY
Jerome Endrass,
University of Konstanz, Germany
Weixiong Cai,
Academy of Forensic Science, China

*CORRESPONDENCE
Joscha Hausam
joscha.hausam@charite.de

SPECIALTY SECTION
This article was submitted to Forensic Psychiatry, a section of the journal Frontiers in Psychiatry

RECEIVED 31 March 2022
ACCEPTED 06 October 2022
PUBLISHED 20 October 2022

CITATION
Hausam J, Franke M, Lehmann RJB and Dahle K-P (2022) Effectiveness of social-therapeutic treatment for serious offenders in juvenile detention: A quasi-experimental study of recidivism.
Front. Psychiatry 13:909781.
doi: 10.3389/fpsyt.2022.909781

Effectiveness of social-therapeutic treatment for serious offenders in juvenile detention: A quasi-experimental study of recidivism

Joscha Hausam [1]*, Melissa Franke[1], Robert J. B. Lehmann[2] and Klaus-Peter Dahle[3]

[1]Institute of Forensic Psychiatry, Charité–Universitätsmedizin Berlin, Berlin, Germany, [2]Department of Psychology, Medical School Berlin, Berlin, Germany, [3]Department of Psychology, University of Hildesheim, Hildesheim, Germany

Due to legislative changes in Germany, there has been an increasing expansion of social-therapeutic facilities for juvenile offenders over the past 15 years. Social therapy comprises an eclectic mix of psychotherapeutic, educational, vocational, and recreational measures in a milieu-therapeutic setting to reduce recidivism of high-risk violent and sexual offenders. This study examined the effectiveness of social-therapeutic treatment on post-release recidivism among juvenile offenders. The sample included male offenders (n = 111) of the juvenile detention center in Berlin, Germany, aged 14–22 years, who were convicted of a violent (94%) or sexual offense (6%). Seventy-three subjects admitted to the social-therapeutic unit were compared to an offense-parallelized control group (n = 38) from the regular units using a propensity score based matching procedure. Initially, the groups did not differ with respect to risk (i.e., Level of Service Inventory - Revised) or risk-related characteristics (e.g., age). Subsequent Cox regression analyses revealed no average treatment effect on recidivism. Since the results indicated that the control group was not untreated, differential treatment effects were examined in a second step. School and vocational trainings had an effect on recidivism. The findings are discussed in light of the challenges in evaluating legally mandated offender treatment.

KEYWORDS

social therapy, juvenile detention, therapeutic community, recidivism, offender treatment, effectiveness, propensity score matching, juvenile offenders

Introduction

According to the latest police crime statistics, 16.7% of all registered crimes in Germany were committed by persons aged 14–21 years (1). While the majority of juveniles usually stop their delinquent behavior without criminal sanctioning, there is a small group showing persistent criminal behavior (2). According to the theory proposed by Moffitt the persistent delinquent behavior can be explained by a cumulative

interaction of biological (e.g., neuropsychological health) and sociocultural (e.g., disadvantaged homes) factors culminating in a pathological personality (e.g., poor self-control, impulsivity). These persistent juvenile offenders are responsible for a majority of the serious crimes committed by their age group (3). The range of dispositional responses to juvenile delinquency includes educational measures, probation, and diversion. These informal measures are used in more than 70% of cases and are an effective means of preventing recidivism (4). Only when these options have been exhausted and proven ineffective detention is the last resort to prevent the perpetuation of a criminal career (5)[1]. However, it has been pointed out that there is little evidence that imprisonment reduces recidivism, but rather may have a criminogenic effect (6, 7). In Germany, two out of three detained juveniles recidivate after their release (8). Accordingly, effective juvenile offender treatment programs are needed to reduce recidivism (9).

Lipsey and Cullen (10) point out that correctional treatment generally has a better effect on juvenile offender recidivism than punishment (e.g., sanctions or supervision). Positive treatment effects were also reported for the subgroup of persistent juvenile offenders in correctional institutions (11). The most recent meta-review, including 48 meta-analyses and reviews from the past 40 years, similarly concludes that treatment programs can be an effective approach to reduce recidivism in juvenile offenders (12). These reviews emphasize that treatment effects vary depending on the criminal justice setting, program modalities, and offender type, among other factors. Roughly summarized, the largest effects are reported for institutionalized, structured, and well-implemented cognitive-behavioral treatment programs in serious (or high-risk) juvenile offenders (10–12). These findings align well with the risk, needs, and responsivity principles (RNR) of effective offender treatment, i.e., treatment should be tailored to each subject's risk level, criminogenic needs, thinking and learning patterns and should include cognitive-behavioral interventions (13). The RNR is empirically well established and has been shown to be effective for young offenders in previous research (14, 15). However, the majority of these studies come from the anglo-american area. In their meta-analysis of European studies with young offenders, Koehler et al. (14) report a significant mean effect in favor of treatment (Odds ratio = 1.34). Of the included studies, only 8% came from Germany. Thus, it can be stated that there is a lack of studies examining effectiveness of treatment with juvenile offenders.

1 This age span is covered by the German Juvenile Justice Act. Children under the age of 14 are not held as criminally responsible. Juveniles (14–17 years) must, and young adults (18–21 years) can be judged by juvenile law. Unlike other countries (e.g., United States), more than 80% of young adults are sentenced by juvenile law for the most serious crimes (4). For simplicity, we will refer to both age groups as "juveniles" in this study.

Social therapy in Germany

Social therapy represents the prototype of correctional treatment in Germany (16). In general, the primary correctional objective is resocialization, i.e., enabling offenders to live a socially responsible life in the future without committing further offenses. Social therapy is a specific, complex, and integrated correctional treatment approach to achieve this goal, particularly for violent and sexual offenders. One distinctive feature of social therapy is that it comprises an eclectic mix of psychotherapeutic, educational, vocational, and recreational measures in a milieu-therapeutic setting (17). The aim is to create a therapeutic climate in a residential group that provides a special social learning environment for the inmates. In this respect, it most closely resembles the concept of therapeutic communities in correctional facilities (18). In addition, the concept of integrative social therapy provides that the social environment in and outside the facility is considered and included in the treatment (17). It is important to note, however, that there is no such thing as "the" social therapy. Treatment methods and interventions can vary significantly between social-therapeutic facilities (16). As a result, an evaluation of the "total package" of social therapy is particularly challenging.

While the first social-therapeutic facilities for adult offenders opened as early as the 1970s, the last 15 years have seen an increasing number of social therapy units for juveniles, prompted by new legislation. Currently, there are 21 social-therapeutic facilities (out of 72 across Germany) for juvenile offenders, of which 15 facilities only started operating after 2006 (19). Admission to such a social-therapeutic unit is regulated by state law and is generally based on the "dangerousness" of an offender (e.g., Art. 20 of the Berlin Juvenile Court Act). Dangerousness is defined as the expectation of serious violent and sexual offenses in the future and is similar to the more common international concept of risk. Other juvenile detainees may also be placed in a social-therapeutic unit if treatment is indicated to achieve the correctional objective of resocialization.

Early evaluations of the effectiveness of social-therapeutic treatment in adult offenders indicated positive effects in the range of $r = 0.10$ (20). More recent, methodologically high-quality studies also show positive treatment effects (21, 22). In contrast, there are only a few studies on the effectiveness of social-therapeutic treatment in juvenile detention (23–26). Guéridon and Suhling (27) point out that these studies provide heterogeneous results and have some methodological weaknesses (e.g., lack of control group). In a preliminary study, social-therapeutic treatment had a positive effect on nonviolent recidivism but not on violent recidivism among police-supervised serious offenders (28).

On the one hand, the shortage of evidence is certainly due to the comparatively "young" social-therapeutic facilities in juvenile detention. On the other hand, evaluating routine correctional practice is a challenge for research. This

is noteworthy because, as part of the above-mentioned amendments to the Juvenile Court Act, the effectiveness evaluation of treatment was enshrined in law (e.g., Section 103 of the Berlin Juvenile Court Act).

Evaluation of correctional treatment

For several years, there has been intense debate about the best way to evaluate the effectiveness of offender treatment (29–31). The focus is primarily on the issue of internal validity, i.e., the extent to which the study design is free of bias and allows causal conclusions to be drawn about treatment effectiveness. The claim to conduct randomized controlled trials (RCTs) and thus to conduct research according to the "gold standard" (32, 33) encounters some barriers in the field of correctional treatment (e.g., random group assignment is difficult to reconcile with legally mandated treatments). In addition, RCTs in routine practice are also discussed critically (34–36). Quasi-experimental studies are rather common in evaluating offender treatment (37). These designs aim to estimate the effect of an intervention despite the lack of randomization, compromising internal validity. However, Ioannidis (38) shows that high-quality quasi-experimental studies can produce equivalent results to RCTs. This is supported by meta-analyses in which high-quality study designs do not influence treatment effect sizes (10, 39). According to Farrington et al. (40), studies are high quality if equivalence of control groups is ensured by statistical control or matching procedures. Propensity score matching (PSM) has recently become increasingly popular for estimating treatment effects in quasi-experimental or observational studies by matching treatment and control groups on a set of observed baseline covariates (41).

Purpose of study

This study uses a quasi-experimental design and PSM to examine the effectiveness of social-therapeutic treatment in juvenile detention compared to an untreated control group. In a first step, the average treatment effect on post-release recidivism is examined. Social-therapeutic treatment is expected to have a significant positive effect on recidivism. In a second step, differential effectiveness of specific training and treatment measures is examined. This is done for two reasons. First, to disentangle the "total package" of social therapy. Second, some interventions are not offered "exclusively" in social therapy, but throughout the juvenile detention center. Since the law requires that juvenile detention has an "educational orientation" (e.g., § 3 of the Berlin Juvenile Court Act), it can be assumed that detainees outside of the social-therapeutic unit also receive treatment in some form.

Methods

Sample

The initial sample included 122 male juvenile and adolescent offenders admitted to the juvenile detention center Berlin between 2014 and 2016. Of these, 79 subjects were allocated to the social-therapeutic unit during November 2014 to July 2016. This was a full survey of all subjects enrolled during this period, there were no exclusion criteria. The remaining 43 subjects were an offense-parallelized sample admitted to the regular units during June to July 2016. Inclusion criteria were a juvenile sentence of at least 2 years for a violent or sexual offense and no indication for social therapy.

Eleven subjects had to be excluded from the analyses because recidivism data were not available[2]. Thus, the sample was $n = 111$, with 73 subjects in the treatment group (TG) and 38 subjects in the control group (CG). The average duration of detention in the TG was 36.98 months ($SD = 13.44$, Min–Max = 16.23–77.21) and 29.41 months in the CG ($SD = 10.47$, Min–Max = 11.70–67.45; $t_{(109)} = -3.03$, $p < 0.001$). In the TG, the average duration of treatment in the social-therapeutic unit was 23.09 months ($SD = 10.65$, Min–Max = 1.12–60.22). Twenty-one participants (28.8%) dropped out of treatment after an average of 17.04 months ($SD = 17.04$, Min–Max = 1.12–40.90)[3]. Of these, nine subjects (42.9%) were transferred back to the regular units of the juvenile detention center and 12 (57.1%) were transferred to an adult correctional facility for reasons of age. Following an intention-to-treat approach, dropouts remained in the TG for the analyses (43).

Social-therapeutic unit

Opened in 2008, the social therapy is a separate unit within the juvenile detention center Berlin with a total of 50 treatment places and its own staff including detention officers, psychologists, and social workers. By law, primarily high-risk violent and sexual offenders are to be treated in the social-therapeutic unit. Allocation to this unit takes place in the diagnostic department. A formal admission criterion is

2 Nine subjects were deported to their country of origin due to lack of residence permit and two cases could not be clearly identified in the police database. With regard to the pretreatment characteristics (Table 1), there were significant differences between excluded and included subjects only for German nationality (9.1 vs. 64.0%; $p < 0.001$) and sentence length (51.55 vs. 39.59 months; $p < 0.01$).

3 A preliminary study found that treatment dropouts are initiated in almost all cases by the social-therapeutic unit mostly due to rule violations (60.5%), lack of treatment motivation (51.2%), lack of therapeutic relationship (25.6%), and/or jeopardizing the correctional goal of other inmates [39.5%; (42)].

TABLE 1 Pretreatment characteristics of the control ($n = 38$) and treatment group ($n = 73$).

	Control	Treatment	χ^2	p	V
	% (n)	% (n)			
German nationality	71.1 (27)	60.3 (44)	1.26	0.262	0.11
Migrant background	76.3 (29)	82.2 (60)	0.54	0.461	0.07
School diploma	34.2 (13)	35.6 (26)	0.02	0.883	0.01
Criminal record with violent or sexual offense	78.9 (30)	83.6 (61)	0.36	0.548	0.06
Index offense					
- Homicide	10.5 (4)	11.0 (8)	1.08	0.781	0.10
- Robbery	60.5 (23)	50.7 (37)			
- Assault	23.7 (9)	31.5 (23)			
- Sexual offense	5.3 (2)	6.8 (5)			
	M (SD)	M (SD)	t	p	d
Index sentence length (months)	38.18 (14.72)	40.32 (12.50)	−0.80	0.425	0.16
Age of onset	15.87 (1.74)	15.33 (1.47)	1.72	0.088	0.34
Age at index	18.37 (2.10)	18.65 (1.74)	−0.75	0.453	0.15
LSI-R	24.13 (8.20)	26.04 (5.80)	−1.42	0.158	0.29

V, Cramer's V effect size; d, Cohen's d effect size; LSI-R, level of service inventory– revised.

a remaining juvenile sentence of at least 18 months and no more than 4 years. Contraindications include below-average intelligence, lack of language skills, predominant addiction problem, acute psychotic disorder, and lack of relationship skills, willingness to cooperate, or group skills.

Following the principles of integrative social therapy, the unit is organized as a therapeutic community and combines psychotherapeutic, educational, vocational, and recreational interventions[4]. According to its concept, treatment follows the RNR principles. Therefore, the primary goal is to address the criminogenic needs of high-risk offenders with structured, cognitive-behavioral interventions and attention to responsivity factors (e.g., motivation and learning style). After a 3-month intake and motivation phase, the treatment phase includes weekly individual psychological sessions and three manualized groups: The Reasoning and Rehabilitation program consisting of 35 dual hours [R&R (44)], an adapted version of the Violent Offender Therapeutic Program with 53 sessions (45), and an adapted version of the Sex Offender Treatment Program with 77 sessions (46). The implementation and regularity of these individual and group interventions is a key difference from the regular units, enabled with better staffing in the social-therapeutic unit (e.g., twice the number of psychologists per detainee). The treatment lasts at least 12 months. In the final discharge phase, the goal is to gradually reintegrate the participants back into the community. Treatment can be discontinued if there is a lack of motivation, willingness to participate, the rules of the unit are repeatedly and significantly violated, or the treatment goals of other participants are endangered. In this case, relocation to a regular unit of the juvenile detention is indicated.

4 It should be noted that the social-therapeutic unit utilizes institution-wide resources. This primarily concerns school, vocational, and recreational measures as well as counseling (e.g., debt counseling) and aftercare services.

Data collection and measures

This study is part of an evaluation project commissioned by the Berlin Senate for Justice, Consumer Protection and Anti-Discrimination. Data were collected based on the inmate file at the respective time of release and the Berlin police database in November 2021. Ethical approval for the study was sought and granted by the Ethics Committee of Charité - Universitätsmedizin Berlin (EA4/131/18). All participants gave written informed consent in accordance with the Declaration of Helsinki and the EU General Data Protection Regulation. The protocol was approved by the Official Data Protection Officer of Charité. Parental consent was obtained for five subjects who were younger than 16 years at the time of data collection.

Pretreatment characteristics

The following characteristics were coded based on detainee files: German nationality (yes/no), migrant background (yes/no), school graduation (yes/no), previous conviction for a violent or sexual offense (yes/no), age at first conviction, age at detention, length of current juvenile sentence, and type of current offense (homicide, robbery, assault, or sexual offense).

In addition, professionally trained research assistants applied the Level of Service Inventory-Revised [LSI-R (47); German version (48)] as a risk measure based on complete youth records of the subjects. The predictive validity of the LSI-R is well documented, also with young offenders (49) and in German speaking samples (50).

Training and treatment

We recorded which training and treatments detainees in both groups participated in. Regarding training measures, we coded whether a person completed educational or vocational training (or these interventions were ongoing at the time of discharge). Further, we recorded whether participants attended

at least one of the following treatment interventions during detention: Individual psychological counseling, R&R program, violence prevention, social skills training, and addiction group. Of the sample, none participated in the sex offender group program, so that is not included here. Please recall that some interventions are offered exclusively (e.g., R&R) or much more intensively in the social-therapeutic unit (e.g., multi-week structured group for violent offenders in the social-therapeutic unit vs. multi-day anti-aggression training in regular units).

Recidivism

Post-release recidivism was obtained from police records. These records capture whether the police accused or apprehended a person being a primary suspect of an offense. Importantly, these constitute neither charges nor convictions and only include offenses committed in the state Berlin. The follow-up period was significantly longer in the TG (M = 60.85 months, SD = 16.23, Min–Max = 24.25–85.19) than in the CG (M = 52.30 months, SD = 10.58, Min–Max = 20.63–65.18; $t_{(103.44)} = -3.34$, $p < 0.01$, $d = 0.59$). We coded the absence/presence and time of a non-violent/non-sexual (e.g., thievery, drug offense), violent (e.g., robbery, assault), and sexual offenses (e.g., sexual abuse, rape). Because of low base rates of sexual recidivism in both the TG ($n = 4$) and CG ($n = 2$), violent and sexual recidivism was collapsed into one category. Rates in the sample were 81.1% ($n = 90$) for non-violent/-sexual recidivism and 51.4% ($n = 57$) for violent/sexual recidivism.

Data analysis

Data analysis was performed using R version 4.12 (51) and the packages "MatchIt" [v3.3.3 (52)] and "survival" [v3.2-13 (53)]. The matching procedure is described first, followed by the subsequent statistical analyses and the results of a power analysis.

Propensity score matching

Based solely on the legal requirement that primarily high-risk violent and sexual offenders are to be treated in the social therapeutic unit, a priori differences between the TG and CG must be assumed. Since it was not possible to conduct a randomized controlled trial in the present study - as is often the case in evaluations of correctional treatment - statistical methods were used to account for this selection bias. PSM was applied to compare subjects who were treated in the social-therapeutic unit with those who were not. PSM is a commonly used analytic method for estimating treatment effects that "allow one to mimic some of the characteristics of an RCT in the context of an observational study" [(41), p. 400]. Simulation studies indicate that PSM can be used in small samples to obtain correct estimates of treatment effect (54).

Technically, the propensity score is defined as the probability of being assigned to a treatment group based on a certain set of (pretreatment) characteristics. PSM consists of several steps: Covariate selection, propensity score estimation, matching specification, and assessment of covariate balance (41). Covariate selection is a critical component of PSM and the optimal approach is the subject of ongoing scientific debate (55, 56). We chose to include variables that are theoretically associated with both treatment and recidivism rather than based on preliminary statistical testing (41). A total number of 12 variables (see Table 1; index offense variable was dummy coded) was selected as covariates. The propensity score was estimated using logistic regression analysis, with treatment as criterion and the covariates as predictors. Based on the propensity score, we used a full matching procedure, primarily because it does not discard any cases and it provides an estimate of the average treatment effect (57, 58). In full matching, subgroups are formed consisting of either one treated and at least one untreated subject or one untreated and at least one treated subject. While full matching is referred to as a matching procedure, it is actually a combination of matching, stratification, and weighting: Strata are formed consisting of treated and control subjects, and the weights resulting from the stratification are then included in subsequent analyses (57, 59).

Finally, covariate balance was assessed before and after matching. It indicates the extent to which the distribution of covariates is similar across groups. As shown by univariate balance summary statistics and visual diagnostics, covariate balance improved (see Supplementary material 1). After matching, all standardized mean differences for the covariates were close to or below 0.1, variance ratios were closer to 1, and empirical cumulative density functions (eCDF) were closer to 0. Visual diagnostics such as eCDF plots, empirical quantile-quantile (eQQ) plots, and kernel density plots also indicate improved covariate balance after matching. Following the recommendations of Ho et al. (60), it was concluded that balance between TG and CG is adequate (but not perfect).

Statistical analysis

Group comparisons were calculated to examine differences in pretreatment characteristics and intervention and treatment participation (t-tests or chi² tests depending on the type of variable). In addition, Cohen's d or Cramer's **V** effect sizes are reported.

Subsequent survival analyses are based on the matched groups. Austin and Stuart (57) describe the use of full matching with survival outcomes. Cox proportional hazards models were estimated to examine the time-dependent recidivism course of individuals in both groups, taking into account the different follow-up times. Two models were calculated for each of the

TABLE 2 Intervention and treatment participation in the control ($n = 38$) and treatment group ($n = 73$).

	Control	Treatment	χ^2	p	V
	% (n)	% (n)			
Educational training	15.8 (6)	20.5 (15)	0.37	0.544	0.06
Vocational training	23.7 (9)	26.0 (19)	0.07	0.787	0.03
Individual psychological treatment	44.7 (17)	98.6 (72)	45.68	<0.001	0.64
R&R program	0 (0)	67.1 (49)	45.67	<0.001	0.64
Social skills training	34.2 (13)	23.3 (17)	1.51	0.219	0.12
Violence prevention group	23.7 (9)	28.8 (21)	0.33	0.567	0.05
Addiction group	36.8 (14)	34.2 (25)	0.07	0.786	0.03

V, Cramer's V effect size; R&R program, reasoning and rehabilitation program.

TABLE 3 Post-release recidivism in the control ($n = 38$) and treatment group ($n = 73$).

	Control	Treatment	χ^2	p	V
	% (n)	% (n)			
Non-violent/-sexual recidivism	78.9 (30)	82.2 (60)	0.17	0.679	0.04
Violent/sexual recidivism	47.4 (18)	53.4 (39)	0.37	0.545	0.06

V, Cramer's V effect size.

two recidivism outcomes. Robust uncertainty estimation (i.e., of standard errors, p-values, and confidence intervals) was used.

First, to assess the average treatment effect, univariate Cox models were estimated by regressing the outcome on the treatment weighted by the matching weights and including the formed subgroups as clusters. In a similar way, secondly, multivariate cox regression models were calculated to examine the effects of the interventions and treatment measures. Importantly, in the first two models, the hazard ratio (HR) corresponds to the marginal effect of treatment, and in the other two, HR reflects conditional effects. Conditional effects denote an average effect at the individual level, while marginal effects denote a population-level effect (61).

There were no outliers in the sample and the assumption of proportional hazards was met in all models (according to Schoenfeld residuals, see Supplementary material 2).

Power analysis

A statistical power analysis was performed to estimate sample size, based on the meta-analysis by Koehler et al. (14) and the effect size of OR = 1.34. With an alpha = 0.05 and power = 0.80, the projected sample size needed with this effect size is approximately $N = 267$ for a Cox proportional hazards model. Since duration of data collection was limited in time by the client as indicated above, the sample may be too small to find the expected effect. Therefore, we performed a *post-hoc* power analysis to examine the power of subsequent analyses. Using the same alpha, available sample size ($n = 111$), expected effect size, and an adjustment for censoring (base rates for both recidivism criteria), a power of 0.49 for non-violent/sexual recidivism and of 0.35 for violent/sexual recidivism was determined. Thus, the probability of a type II error is increased in the present study.

Results

There were no significant group differences in pretreatment characteristics between CG and TG (see Table 1). Indicated by small (but non-significant) effects, however, subjects in the TG were younger at onset ($d = 0.34$) and had a slightly higher LSI-R total score ($d = 0.29$).

A more differentiated picture emerged for intervention and treatment participation (see Table 2). In both groups, about one in four to one in five subjects completed either school graduation or vocational training (or the intervention was still ongoing at the time of discharge), with no significant differences. Similarly, there were no differences between TG and CG in participation in the social skills training (23.3 vs. 34.2%), violence prevention (28.8 vs. 23.7%), and addiction treatment groups (34.2 vs. 36.8%). However, the subjects in the TG attended more frequently individual psychological sessions [98.6 vs. 44.7%; $\chi^2(1) = 45.68$, $p < 0.001$, $V = 0.64$] and the R&R group [67.1 vs. 0%; $\chi^2(1) = 45.67$, $p < 0.001$, $V = 0.64$].

Rates of recidivism are shown in Table 3. There were no significant differences between TG and CG in non-violent/-sexual recidivism (82.2 vs. 78.9%) and violent/sexual recidivism (53.4 vs. 47.4%). Noteworthy, there were no statistically significant differences in recidivism with respect to the index offense and between completers and dropouts in the TG.

Dropouts showed a weak tendency to relapse more frequently (90.5 vs. 78.8% for non-violent/-sexual and 57.1 vs. 51.9% for violent/sexual recidivism).

In the univariate Cox models, no average treatment effect was evident for either non-violent/-sexual recidivism [LR-$\chi^2(1) = 1.35$, $p = 0.2$] or violent/sexual recidivism [LR-$\chi^2(1) = 0$, $p = 1$]. The hazard ratio for non-violent/-sexual recidivism was slightly lower in the TG (HR = 0.76) and for violent/sexual recidivism it was almost identical to that of the CG (HR = 1.01), although neither was significant (see Table 4).

The results of the multivariate Cox models are shown in Table 5. Neither the model for non-violent/-sexual recidivism [LR-$\chi^2(7) = 7.14$, $p = 0.4$] nor violent/sexual recidivism was significant [$\chi^2(7) = 11.74$, $p = 0.1$]. A significant conditional effect of vocational training on severe recidivism (HR = 0.69, $p < 0.01$) and a marginally significant effect of school training on non-violent/-sexual recidivism (HR = 0.87, $p = 0.063$) was found.

Discussion

Due to legal changes in Germany, there has been a strong growth in social-therapeutic facilities for the treatment of serious juvenile offenders in recent years. These institutions are based on the concept of integrative social therapy, for which positive results have been reported in the adult correctional system (16). Studies on the effectiveness of social therapy in juvenile detention are rare. Therefore, the aim of the present study was to compare post-release recidivism in a group of young violent and sexual offenders who received social-therapeutic treatment with an offense-parallelized control group of juvenile detainees. The groups were compared using a propensity score based full matching procedure (57, 59, 62).

No average treatment effect was found for both recidivism criteria. Recidivism rates were comparably high in both groups. This result is contrary to our expectations, considering that the investigated social-therapeutic unit includes essential features that have been shown to be effective in juvenile offender treatment [e.g., cognitive-behavioral interventions with high-risk offenders (10–12)]. Further, it is not consistent with the results of a preliminary study, which found a treatment effect on non-violent recidivism (28). Therefore, some aspects that may have affected the results should be considered here.

First, by law, high-risk juvenile offenders are primarily to be treated in the social-therapeutic unit. This is in line with the risk principle of effective offender treatment, according to which treatment intensity should be based on risk (13). However, the analyses showed that there were hardly any group differences, neither in risk (i.e., LSI-R score) nor in risk-relevant characteristics (e.g., age). One explanation could be that the diagnostic unit did not strictly adhere to the risk principle. Intensive treatment, such as social therapy, that is not following the risk level is less effective or may even have adverse effects in the case of low-risk offenders (13). However, this is contradicted by the result that more than half of both groups in the sample posed at least a moderate-high risk. Another explanation could be that the treatment assignment was "correct" but we were unable to reflect these risk differences in our data. In this context, Dahle and Schmidt (50) reported that the LSI-R had unsatisfactory predictive validity among young offenders with a migrant background from a predominantly Muslim culture. Similar results have been reported for other ethnic groups (49, 63). Approximately 80% of our sample had a migrant background. Hence, it would be possible that the LSI-R was not an appropriate choice in the present study (64). Possible unidentified group differences would not have been controlled for in the matching procedure and thus would have systematically affected the results.

Second, not all participants received the social-therapeutic treatment as planned. The dropout rate in our study is largely consistent with international (65) and national findings (66, 67). Olver et al. (65) also note that dropouts are at higher risk before treatment and have higher recidivism rates after release than completers. Thus, treatment dropout may be a confounding characteristic in many cases. Another hypothesis regarding this mechanism is that treatment attrition may further increase the risk of recidivism compared to no treatment (68). We included dropouts in the analyses to reduce this methodological bias and to obtain a more accurate estimate of treatment effectiveness as delivered in routine practice (43). Nevertheless, it may be assumed that the inclusion of dropouts had an impact on the results. Our preliminary analyses also suggest a dropout effect; at the very least, recidivism was slightly higher. More differentiated analyses of dropouts and completers should be conducted in the future to provide relevant information on treatment efficacy, appropriateness of treatment assignments, and obstacles inherent to treatment (67).

Third, the results showed that the control group was not untreated. This corresponds to the legal requirement for an "educational orientation" of juvenile detention. The subjects of both groups equally participated in school and vocational trainings as well as some treatment groups (e.g., social skills group). There were differences only in participation in individual psychological sessions and in the R&R group (the latter actually being offered only in the social-therapeutic unit). Thus, trainings and treatment may also had a recidivism-reducing effect in the control group. We explored this question with further analyses.

A second objective of this study was to examine differential effects of training and treatment measures throughout the juvenile detention center. The multivariate Cox regression analyses showed a significant effect for vocational training. Accordingly, participants who had completed vocational training in detention or who were still in vocational training at the time of release had a 31%

TABLE 4 Average treatment effects assessed with full matching procedure in univariate cox regression analyses ($n = 111$).

	HR	*SE*	*z*	*p*	95% CI
Non-violent/-sexual recidivism	0.76	0.24	−1.15	0.249	0.47, 1.22
Violent/sexual recidivism	1.01	0.31	0.03	0.979	0.55, 1.84

HR, hazard ratio; SE, standard error; CI, confidence interval.

TABLE 5 Conditional effects of intervention and treatment participation assessed with full matching procedure in multivariate cox regression analyses ($n = 111$).

	HR	*SE*	*z*	*p*	95% CI
Non-violent/-sexual recidivism					
Educational training	0.87	0.08	−1.86	0.063	0.75, 1.01
Vocational training	0.89	0.08	−1.40	0.162	0.75, 1.05
Individual psychological treatment	0.71	0.29	−1.16	0.246	0.40, 1.26
R&R program	0.85	0.28	−0.58	0.564	0.49, 1.48
Social skills training	1.03	0.23	0.12	0.905	0.66, 1.60
Violence prevention group	0.98	0.23	−0.10	0.921	0.62, 1.54
Addiction group	1.01	0.20	0.08	0.940	0.69, 1.51
Violent/sexual recidivism					
Educational training	0.88	0.13	−1.00	0.316	0.71, 1.23
Vocational training	0.69	0.14	−2.62	0.001	0.53, 0.95
Individual psychological treatment	1.08	0.41	0.18	0.857	0.47, 2.46
R&R program	0.99	0.31	−0.05	0.962	0.52, 1.32
Social skills training	1.31	0.37	0.73	0.463	0.71, 2.67
Violence prevention group	1.00	0.36	−0.01	0.991	0.48, 1.83
Addiction group	1.07	0.31	0.22	0.826	0.67, 1.79

HR, hazard ratio; SE, standard error; CI, confidence interval; R&R program, reasoning and rehabilitation program.

reduced risk of violent/sexual recidivism. In addition, a marginally significant effect was found for school training on non-violent/-sexual recidivism. This is consistent with meta-analytic evidence and reinforces the importance of school and vocational training in juvenile detention (14, 69).

Limitations

Comparison of our results with previous studies on juvenile offender treatment may be limited by differences such as legislature, treatment context, and sample characteristics. These may have affected external validity. For example, four in five of the juvenile offenders in our sample had a migration background whereas only one in four has such a background in the general population in Germany. Even though this point could not have affected our results as both samples were matched future studies might want to investigate the social features of juvenile offenders in a therapeutic context in more detail. Furthermore, some methodological limitations have to be taken into account. First, the small sample (especially the control group) and the reduced power of the analyses must be considered. More precisely, it is to be expected that an actual effect was statistically not found. Second, the quasi-experimental design is particularly noteworthy. Propensity score matching can produce valid results even in small samples (54), but the analyses are always based on observed variables only. Therefore, other characteristics not included in the present study could have a significant influence. Because future evaluations will continue to be mostly quasi-experimental, there is a need for studies that examine what cofounded variables should be considered in matching procedures in the context of offender treatment. Third, diverse offense groups were examined together. These did not differ in recidivism, but it is still conceivable that offender types react differently to social-therapeutic treatment. Heterogeneous treatment effects should be examined in more detail. Another limitation relates to the coding of treatment participation. While the coding of educational and vocational trainings implied a certain level of intensity and success (completed or ongoing), for all other treatments, a single participation was already assessed. Since the intensity or success of treatment participation is central to the recidivism-reducing effect, the operationalization may have led to insufficient differentiation. This could be an explanation for the lack of conditional effects. In addition, we did not assess treatment integrity (70). Finally, future studies should consider additional recidivism data with similarly long follow-up periods to make more robust conclusions about the

effectiveness of social-therapeutic treatment. The outcomes used here are based on police proceedings, of which we do not know whether and how they were further proceeded (e.g., to court). Beyond that, they do not allow any statement about recidivism severity. Another possible bias is that only offenses in the state of Berlin, and not all of Germany, were considered. As part of our ongoing project, we will soon be able to collect recidivism data based on criminal records and conduct more sophisticated analyses.

Conclusion

With the increase in social-therapeutic units in juvenile detention and the demand for evidence-based practice, evaluations of treatment effects in routine practice are very important, but also challenging. The present quasi-experimental study did not find sufficient evidence for an average treatment effect of social-therapeutic treatment in juvenile detention. As outlined, however, our results should be interpreted with caution. Among other things, the results showed that the control group was not untreated. Subsequent analyses revealed significant effects of educational and vocational training on recidivism in the overall sample. On the one hand, this underscores that it may be worth examining for differential effects of specific training and treatment interventions (rather than looking exclusively at average treatment effects). This seems to be especially important for correctional treatment as complex and comprehensive as social therapy. On the other hand, the results raise the question of whether the higher costs of social-therapeutic treatment are justified. Future research should therefore address the extent to which specific social-therapeutic treatment, beyond the interventions usually provided in juvenile detention (e.g., educational or vocational training), affect recidivism. There will continue to be obstacles in presenting causal treatment effects of the "total package" of social therapy. Nevertheless, more replications are needed (71).

Data availability statement

The datasets presented in this article are not readily available because this study is part of an evaluation project commissioned by the Berlin Senate for Justice, Consumer Protection and Anti-Discrimination. We do not have the right to disclose the data. Requests to access the datasets should be directed to poststelle@senjustva.berlin.de.

Ethics statement

The studies involving human participants were reviewed and approved by Ethics Committee of Charité - Universitätsmedizin Berlin, Germany (EA4/131/18). Written informed consent to participate in this study was provided by the participants or participants' legal gurdian/next of kin.

Author contributions

JH and MF designed the study. MF collected data. JH performed statistical analyses and wrote the first draft of the manuscript with support of MF and RL. K-PD supervised the project. All authors contributed to manuscript revision, read, and approved the submitted version.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The evaluation project was funded by the Senate for Justice, Consumer Protection and Anti-Discrimination of Berlin, Germany.

Acknowledgments

We would like to thank the staff of the juvenile detention center Berlin, Germany and particularly the social-therapeutic unit for their kind assistance. In addition, we would like to thank all the research assistants and students involved in the evaluation project.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2022.909781/full#supplementary-material

References

1. Bundeskriminalamt. *Polizeiliche Kriminalstatistik 2020* [Police crime statistics 2020]. (2021). Available online at: www.bka.de/pks2020 (accessed March 13, 2022).

2. Moffitt TE. Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy. *Psychol Rev.* (1993) 100:674–701. doi: 10.1037/0033-295X.100.4.674

3. Piquero AR, Jennings WG, Barnes JC. Violence in criminal careers: a review of the literature from a developmental life-course perspective. *Aggress Violent Behav.* (2012) 17:171–9. doi: 10.1016/j.avb.2012.02.008

4. Dünkel F. Youth Justice in Germany. In: Oxford Handbooks Editorial Board, editor. *Oxford Handbooks Online: Criminology and Criminal Justice: Scholarly Research Reviews*. Oxford: Oxford University Press (2012). doi: 10.1093/oxfordhb/9780199935383.013.68

5. Bliesener T. Jugenddelinquenz [Juvenile Delinquency]. In: Bliesener T, Lösel F, Köhnken G, editors. *Lehrbuch der Rechtspsychologie*. Göttingen: Hogrefe (2014), p. 64–75.

6. Cullen FT, Jonson CL, Nagin DS. Prisons do not reduce recidivism: the high cost of ignoring science. *Prison J.* (2011) 91:48–65. doi: 10.1177/0032885511415224

7. Nagin DS, Cullen FT, Jonson CL. Imprisonment and reoffending. *Crime Justice.* (2009) 38:115–200. doi: 10.1086/599202

8. Jehle J-M, Albrecht H-J, Hohmann-Fricke S, Tetal C. *Legalbewährung Nach Strafrechtlichen Sanktionen: Eine Bundesweite Rückfalluntersuchung 2013 bis 2016 und 2004 bis 2016 [Recidivism After Criminal Sanctions: A Nationwide Recidivism Survey 2013 to 2016 and 2004 to 2016]*. Forum Verlag Godesberg (2020). Available online at: https://www.bmj.de/SharedDocs/Downloads/DE/Service/StudienUntersuchungenFachbuecher/Legalbewaehrung_nach_strafrechtlichen_Sanktionen_eine_Rueckfalluntersuchung.html (accessed March 21, 2022).

9. Lehmann RJB, Schmidt AF, Hausam J. Grundlagen der deliktpräventiven Therapie [Basics of crime prevention therapy]. In: Habermeyer E, Dreßing H, Seifert D, Lau S, editors. *Praxishandbuch Therapie in der Forensischen Psychiatrie und Psychologie*. Amsterdam: Elsevier (2022), p. 67–77.

10. Lipsey MW, Cullen FT. The effectiveness of correctional rehabilitation: a review of systematic reviews. *Ann Rev Law Soc Sci.* (2007) 3:297–320. doi: 10.1146/annurev.lawsocsci.3.081806.112833

11. Garrido V, Morales LA. Serious (violent or chronic) juvenile offenders: a systematic review of treatment effectiveness in secure corrections. *Campbell Syst Rev.* (2007) 3:1–46. doi: 10.4073/csr.2007.7

12. Pappas LN, Dent AL. The 40-year debate: a meta-review on what works for juvenile offenders. *J Exp Criminol.* (2021). doi: 10.1007/s11292-021-09472-z. [Epub ahead of print].

13. Bonta J, Andrews DA. *The Psychology of Criminal Conduct,* 6th ed. London: Routledge (2017). doi: 10.4324/9781315677187

14. Koehler JA, Lösel F, Akoensi TD, Humphreys DK. A systematic review and meta-analysis on the effects of young offender treatment programs in Europe. *J Exp Criminol.* (2013) 9:19–43. doi: 10.1007/s11292-012-9159-7

15. Lipsey MW, Wilson DB. Effective intervention for serious juvenile offenders: a synthesis of research. In: Loeber R, Farrington DP, editors. *Serious and Violent Juvenile Offenders: Risk Factors and Successful Interventions*. London: Sage Publications, Inc. (1998), p. 313–45. doi: 10.4135/9781452243740.n13

16. Lösel F, Egg R. Social-therapeutic Institutions in Germany: description and evaluation. In: Cullen E, Jones L, Woodward R, editors. *Therapeutic Communities for Offenders*. Hoboken, NJ: Wiley and Sons (1997), p. 181–203.

17. Wischka B, van den Boogaart H. Sozialtherapie im Justizvollzug [Social therapy in the correctional system]. In: Maelicke B, Suhling S, editors. *Das Gefängnis auf dem Prüfstand: Zustand und Zukunft des Strafvollzugs*. New York, NY: Springer (2018), p. 129–58. doi: 10.1007/978-3-658-20147-0_7

18. Lipton DS, Pearson FS, Cleland CM, Yee D. The effects of therapeutic communities and milieu therapy on recidivism. In: McGuire J, editor. *Offender Rehabilitation and Treatment: Effective Programmes and Policies to Reduce Re-offending*. Hoboken, NJ: John Wiley (2002), p. 39–77.

19. Etzler S. *Sozialtherapie im Strafvollzug 2020: Ergebnisübersicht zur Stichtagserhebung zum 31.03.2020* [Social therapy in the correctional system 2020: overview of results for the cut-off date survey as of 31.03.2020] (Bd. 22). Wiesbaden: KrimZ (2020).

20. Lösel F, Köferl P. Evaluation research on correctional treatment in West Germany: A meta-analysis. In: Wegener H, Lösel F, Haisch J, editor. *Criminal Behavior and the Justice System*. New York, NY: Springer (1989), p. 334–55. doi: 10.1007/978-3-642-86017-1_21

21. Bussmann K-D, Richter K. *Kriminologische Evaluation der Sozialtherapeutischen Anstalt Halle (Saale)*. Abschlussbericht an die DFG [Criminological Evaluation of the Social-Therapeutic Institution Halle (Saale). Final report to the DFG]. Halle: Martin-Luther Universität (2013).

22. Lösel F, Link E, Schmucker M, Bender D, Breuer M, Carl L, et al. On the effectiveness of sexual offender treatment in prisons: a comparison of two different evaluation designs in routine practice. *Sex Abuse.* (2020) 32:452–75. doi: 10.1177/1079063219871576

23. Bieschke V. *Evaluation der Sozialtherapeutischen Abteilung in der Jugendstrafanstalt Neustrelitz* [Evaluation of the Social Therapeutic Unit in the Neustrelitz Juvenile Detention Center]. *Forum Strafvollzug.* (2014) 63:232–7.

24. Hosser D, Bosold C, Lauterach O. Sozialtherapeutische behandlung von jungen sexualstraftätern: ergebnisse einer evaluationsstudie [Social-therapeutic treatment of young sex offenders: results of an evaluation study]. *Recht Psychiatr.* (2006) 24:125–33.

25. Seitz C, Specht F. Legalbewährung nach entlassung aus dem rudolf-sieverts-haus der jugendanstalt hameln [recidivism after release from the rudolf sieverts house at hamelin juvenile detention center]. *Kriminalpädagogische Praxis.* (2002) 42:54–69.

26. Wößner G, Wienhausen-Knezevic E, Rauschenbach J. Sozialtherapie im Jugendstrafvollzug – und dann? [Social therapy in juvenile detention—And then?]. In: Dölling D, Jehle J-M, editors. *Täter – Taten – Opfer: Grundlagenfragen und Aktuelle Probleme der Kriminalität und ihrer Kontrolle*. Mönchengladbach: Forum Verlag Godesberg (2013), p. 643–71.

27. Guéridon M, Suhling S. Sozialtherapie im Jugendstrafvollzug: was ist das, was soll das und bringt das was? *[Social therapy in juvenile detention: what is it, what is it supposed to do and does it achieve anything?]. Z Jugendkriminalrecht Jugendhilfe.* (2015) 26:130–9.

28. Hausam J, Seewald K, Mannert AL, Dahle K-P. Junge Intensivtäter als besondere Herausforderung für Jugendstrafvollzug und Sozialtherapie [Young intensive offenders as a special challenge for juvenile justice and social therapy]. *Forensische Psychiatr Psychol Kriminol.* (2020) 14:67–84. doi: 10.1007/s11757-020-00583-3

29. Hollin CR. Evaluating offending behaviour programmes: does only randomization glister? *Criminol Crim Justice.* (2008) 8:89–106. doi: 10.1177/1748895807085871

30. Marshall WL, Marshall LE. The utility of the random controlled trial for evaluating sexual offender treatment: the gold standard or an inappropriate strategy? *Sex Abuse.* (2007) 19:175–91. doi: 10.1177/107906320701900207

31. Seto MC, Marques JK, Harris GT, Chaffin M, Lalumière ML, Miner MH, et al. Good science and progress in sex offender treatment are intertwined: a response to Marshall and Marshall (2007). *Sex Abuse.* (2008) 20:247–55. doi: 10.1177/1079063208317733

32. Rice ME, Harris GT. Treatment for adult sex offenders. May we reject the null hypothesis? In: Harrison K, Rainey B, editor. *The Wiley-Blackwell Handbook of Legal and Ethical Aspects of Sex Offender Treatment and Management*. Hoboken, NJ: John Wiley and Sons, Ltd. (2013), 219–35. doi: 10.1002/9781118314876.ch13

33. Weisburd D. The importance of randomized experiments in evaluating crime prevention. In: Welsh BC, Farrington DP, editors. *The Oxford Handbook of Crime Prevention*. Oxford: Oxford University Press (2012), p. 446–65. doi: 10.1093/oxfordhb/9780195398823.013.0022

34. Berk RA. Randomized experiments as the bronze standard. *J Exp Criminol.* (2005) 1:417–33. doi: 10.1007/s11292-005-3538-2

35. Cartwright N. Are RCTs the gold standard? *BioSocieties*. (2007) 2:11–20. doi: 10.1017/S1745855207005029

36. Nagin DS, Sampson RJ. The real gold standard: measuring counterfactual worlds that matter most to social science and policy. *Ann Rev Criminol.* (2019) 2:123–45. doi: 10.1146/annurev-criminol-011518-024838

37. Farrington DP, Lösel F, Braga AA, Mazerolle L, Raine A, Sherman LW, et al. Experimental criminology: looking back and forward on the 20th anniversary of the Academy of Experimental Criminology. *J Exp Criminol.* (2020) 16:649–73. doi: 10.1007/s11292-019-09384-z

38. Ioannidis JPA. Why most published research findings are false. *PLoS Med.* (2005) 2:e124. doi: 10.1371/journal.pmed.0020124

39. Lösel F, Schmucker M. The effectiveness of treatment for sexual offenders: a comprehensive meta-analysis. *J Exp Criminol.* (2005) 1:117–46. doi: 10.1007/s11292-004-6466-7

40. Farrington DP, Gottfredson D, Lawrence W, Welsh BC, Sherman L, Farrington DP, et al. Maryland scientific methods scale. In: Sherman LW, Farrington DP, Welsh BC, MacKenzie DL, editors. *Evidence-Based Crime Prevention*. London: Routledge. (2002). p. 13–21. doi: 10.4324/9780203166697_chapter_2

41. Austin PC. An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behav Res.* (2011) 46:399–424. doi: 10.1080/00273171.2011.568786

42. Warth D. *Unterschiede zwischen Abbrechern und Nicht-Abbrechern sozialtherapeutischer Behandlung im Jugendstrafvollzug und Gründe für den Abbruch [Differences between dropouts and completers in social-therapeutic treatment in juvenile detention and reasons for dropout]* (Unpublished Thesis). Technische Universität Dresden, Dresden (2015).

43. Endres J, Breuer MM, Stemmler MK. "Intention to treat" oder "treatment as received" – Umgang mit Abbrechern in der Forschung zur Straftäterbehandlung: Methodische Überlegungen und Beispiele aktueller Studien ["Intention to treat" or "treatment as received" - dealing with dropouts in offender treatment research: methodological considerations and examples of recent studies]. *Forensische Psychiatr Psychol Kriminol.* (2016) 10:45–55. doi: 10.1007/s11757-015-0348-x

44. Ross RR, Fabiano EA, Ewles CD. Reasoning and Rehabilitation. *Int J Offender Ther Comp Criminol.* (1988) 32:29–35. doi: 10.1177/0306624X8803200104

45. Feelgood S. *Behandlungsprogramm für Gewaltstraftäter BPG [Treatment program for violent offenders BPG]*. Brandenburg an der Havel (2008).

46. Wischka B. Was wirkt? *Sozialtherapie für Sexualstraftäter [What works? Social therapy for sex offenders]. Kriminalpädagogische Praxis.* (2001) 29:27–34.

47. Andrews DA, Bonta J. *LSI-R: The Level of Service Inventory-Revised*. North Tonawanda, NY: Multi-Health Systems (1995).

48. Dahle K-P, Harwardt F, Schneider-Njepel V. *Inventar zur Einschätzung des Rückfallrisikos und des Betreuungs- und Behandlungsbedarfs von Straftätern* (LSI-R): Deutsche Version des Level of Service Inventory—Revised nach Don Andrews und James Bonta [German version of the Level of Service Inventory-Revised]. Göttingen: Hogrefe (2012).

49. Olver ME, Stockdale KC, Wormith JS. Thirty years of research on the level of service scales: a meta-analytic examination of predictive accuracy and sources of variability. *Psychol Assess.* (2014) 26:156–76. doi: 10.1037/a0035080

50. Dahle K-P, Schmidt S. Prognostische validität des level of service inventory-revised. *Forensische Psychiatr Psychol Kriminol.* (2014) 8:104–15. doi: 10.1007/s11757-014-0256-5

51. R Core Team. R: A Language and Environment for Statistical Computing. Vienna: R Foundation for Statistical Computing (2021). Avaialble online at: https://www.R-project.org/ (accessed March 14, 2022).

52. Ho DE, Imai K, King G, Stuart EA. MatchIt: nonparametric preprocessing for parametric causal inference. *J Stat Softw.* (2011) 42:1–28. doi: 10.18637/jss.v042.i08

53. Therneau T. *A Package for Survival Analysis in R*. (2021). Avaialble online at: https://CRAN.R-project.org/package=survival (accessed March 14, 2022).

54. Pirracchio R, Resche-Rigon M, Chevret S. Evaluation of the propensity score methods for estimating marginal odds ratios in case of small sample size. *BMC Med Res Methodol.* (2012) 12:70. doi: 10.1186/1471-2288-12-70

55. Brookhart MA, Schneeweiss S, Rothman KJ, Glynn RJ, Avorn J, Stürmer T. Variable selection for propensity score models. *Am J Epidemiol.* (2006) 163:1149–56. doi: 10.1093/aje/kwj149

56. VanderWeele TJ. Principles of confounder selection. *Eur J Epidemiol.* (2019) 34:211–9. doi: 10.1007/s10654-019-00494-6

57. Austin PC, Stuart EA. Optimal full matching for survival outcomes: a method that merits more widespread use. *Stat Med.* (2015) 34:3949–67. doi: 10.1002/sim.6602

58. Gu XS, Rosenbaum PR. Comparison of multivariate matching methods: structures, distances, and algorithms. *J Comput Graph Stat.* (1993) 2:405–20. doi: 10.1080/10618600.1993.10474623

59. Austin PC, Stuart EA. Estimating the effect of treatment on binary outcomes using full matching on the propensity score. *Stat Methods Med Res.* (2017) 26:2505–25. doi: 10.1177/0962280215601134

60. Ho DE, Imai K, King G, Stuart EA. Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. *Polit Anal.* (2007) 15:199–236. doi: 10.1093/pan/mpl013

61. Austin PC. The performance of different propensity score methods for estimating marginal hazard ratios. *Stat Med.* (2013) 32:2837–49. doi: 10.1002/sim.5705

62. Austin PC. The use of propensity score methods with survival or time-to-event outcomes: Reporting measures of effect similar to those used in randomized experiments. *Stat Med.* (2014) 33:1242–58. doi: 10.1002/sim.5984

63. Wilson HA, Gutierrez L. Does one size fit all?: a meta-analysis examining the predictive ability of the level of service inventory (LSI) with Aboriginal offenders. *Crim Justice Behav.* (2014) 41:196–219. doi: 10.1177/0093854813500958

64. Schmidt S, van der Meer E, Tydecks S, Bliesener T. How culture and migration affect risk assessment. *Eur J Psychol Appl Legal Context.* (2018) 10:65–78. doi: 10.5093/ejpalc2018a7

65. Olver ME, Stockdale KC, Wormith JS. A meta-analysis of predictors of offender treatment attrition and its relationship to recidivism. *J Consult Clin Psychol.* (2011) 79:6–21. doi: 10.1037/a0022200

66. Brunner F, Neumann I, Yoon D, Rettenberger M, Stück E, Briken P. Determinants of dropout from correctional offender treatment. *Front Psychiatry.* (2019) 10:142. doi: 10.3389/fpsyt.2019.00142

67. Carl LC, Schmucker M, Lösel F. Predicting attrition and engagement in the treatment of young offenders. *Int J Offender Ther Comp Criminol.* (2020) 64:355–74. doi: 10.1177/0306624X19877593

68. McMurran M, Theodosi E. Is treatment non-completion associated with increased reconviction over no treatment? *Psychol Crime Law.* (2007) 13:333–43. doi: 10.1080/10683160601060374

69. Itlescas SR, Sánchez-Meca J, Genovés VG. Treatment of offenders and recidivism: assessment of the effectiveness of programmes applied in Europe. *Psychol Spain.* (2001) 5:47–62.

70. Andrews DA, Dowden C. Managing correctional treatment for reduced recidivism: a meta-analytic review of programme integrity. *Legal Criminol Psychol.* (2005) 10:173–87. doi: 10.1348/135532505X36723

71. Lösel F. Evidence comes by replication, but needs differentiation: the reproducibility issue in science and its relevance for criminology. *J Exp Criminol.* (2018) 14:257–78. doi: 10.1007/s11292-017-9297-z

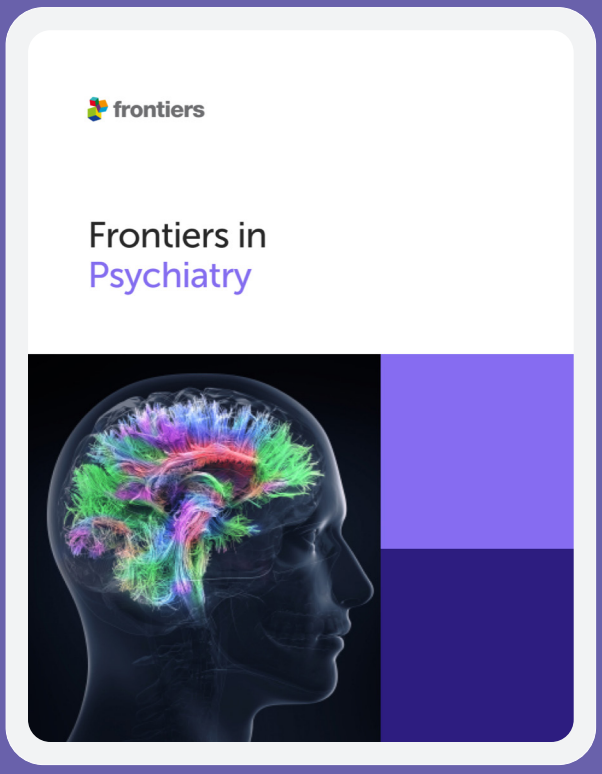
Frontiers in Psychiatry

Explores and communicates innovation in the field of psychiatry to improve patient outcomes

The third most-cited journal in its field, using translational approaches to improve therapeutic options for mental illness, communicate progress to clinicians and researchers, and consequently to improve patient treatment outcomes.

Discover the latest Research Topics

See more →



Frontiers

Avenue du Tribunal-Fédéral 34
1005 Lausanne, Switzerland
frontiersin.org

Contact us

+41 (0)21 510 17 00
frontiersin.org/about/contact