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Editors' showcase: mental health occupational therapy

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Editorial: Editors' showcase: mental health occupational therapy

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KEYWORDS

return to work, work environment, time use patterns, social participation, mental health recovery, recovery colleges, self-management, occupational therapy

Editorial on the Research Topic
Editors' showcase: mental health occupational therapy

We are very proud to introduce the first Research Topic to be presented in the Mental Health Occupational Therapy section of Frontiers in Psychiatry. The Mental Health Occupational Therapy journal section is committed to advancing knowledge about how occupational therapy practitioners (alongside people with lived and living experience of mental health or emotional challenges, families and carers, and colleagues from other disciplines) contribute to supporting the mental health recovery and wellbeing of individuals, families and populations in diverse cultural and service contexts globally.

Just over 10 years ago, we wrote an Editorial together encouraging mental health occupational therapy practitioners and researchers to expand the focus of their work to reflect the breadth of scope of occupational therapy practice (1). Reflecting on progress since then, we are pleased to see such a diversity of papers presented in this first Research Topic, the Editors' Showcase: Mental Health Occupational Therapy. It really reflects many of the ways in which occupational therapy can support people with diverse challenges to work towards optimal mental health and wellbeing.

The nine papers represent contributions to understanding how participation in occupations of daily life and mental health interrelate, and to how occupational therapists promote mental health recovery and wellbeing. The contributors include international and interdisciplinary collaborations and they report research undertaken with wide-ranging populations and in diverse contexts, including workplaces, primary care and community mental health services. Broadly, key themes focus on the impact of work conditions on mental health and support for return to work; approaches for exploring and enabling self-determined, meaningful and rewarding forms of activity engagement; and training for recovery oriented practice. The individual papers address:

- The work experiences of recent immigrants in precarious work environments and how work conditions can impact their mental health and wellbeing, highlighting initiatives necessary to create safe and culturally friendly workplaces (Shankar et al.)

- Occupational therapy practitioners' involvement with public safety personnel who experienced psychological injury during the return to work process, which suggests more timely pathways may influence return to work outcomes (Edgelow and Fecicia)

- An innovative occupational therapy practitioner-led program in primary care, which aims to enhance interprofessional collaboration and to promote recovery and sustainable return to work outcomes for employees on sick leave for common mental disorders (Labouret et al.)

- The importance of exploring and supporting meaningful time use in the context of community mental health services (Fossey et al.)

- The patterns of participation in daily life activities among individuals living with Post Traumatic Stress Disorder and a reflection on how occupational therapy may support more personally meaningful and rewarding participation (Shapira et al.)

- The relationships between symptom impact, cognition, sensory modulation and patterns of participation reported by individuals with recent-onset mental illness in inpatient and community programs, and suggestions regarding possible areas for early intervention (Lipskaya-Velikovsky et al.)

- The identification of factors influencing social participation post discharge from hospital among individuals living with mental illness who received occupational therapy support in acute care (Nagashima et al.)

- An innovative application of a well-established occupational therapy approach more commonly used in pediatrics (Cognitive Orientation to daily Occupational Performance [COOP]), which shows promise as a way of supporting individuals experiencing high-prevalence mental disorders to develop personalized strategies that address complex needs and enhance their engagement in meaningful activities (Wong et al.)

- Mental health practitioners' experiences of Recovery College courses and their benefits, which highlights the potential of Recovery Colleges to offer enriching and accessible training to develop capabilities for recovery - oriented practice among mental health practitioners, including occupational therapy practitioners (Bellemare et al.)

We hope that occupational therapy practitioners and others across the world engage with this diverse array of research articles and use this knowledge to not only improve occupational therapy practices but also to encourage further research that advances the evidence informing occupation focused approaches for supporting the mental health and wellbeing of all individuals and enabling communities to thrive.

Author contributions

EF: Writing – original draft, Writing – review & editing. JS: Writing – original draft, Writing – review & editing.

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.

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Daily life participation in PTSD: pilot study on patterns and correlators

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Introduction: Participation in daily life activities with both the personal and community meaning is an important component of health and well-being. Even though there are mounting reports on the challenges in various aspects of daily-life functioning among individuals with post-traumatic stress disorder (PTSD), to date little research has been conducted on their comprehensive patterns of participation. The study aimed to describe objective and subjective participation dimensions in PTSD compared to healthy controls and investigate the association between personal and environmental factors and participation.

Methods: Sixty-one individuals were enrolled in two groups: PTSD (N=31; age: M=34.3; women:77.4%) and healthy controls matched by age and gender. The PTSD group completed standard assessments for symptom severity, general cognition, executive function (EF), sensory processing, self-efficacy, functional capacity, and environmental properties. Both groups completed a participation questionnaire.

Results: Individuals with PTSD participated with low intensity and diversity, more occupations were abandoned ($-4.73<t<5.73$, $p<0.05$), and less meaning was found in the included occupations. Participation objective dimensions were associated with self-reported EF ($-0.47<r<-0.42$, $p<0.05$), sensory modulation profile ($2.51<t<2.81$, $p<0.05$), and environmental properties ($-0.44<r<0.5$, $p<0.05$), but not with PTSD symptom severity, and objective measures of cognition and functional capacity. No correlators were identified for subjective participation dimensions.

Discussion: The study demonstrates profound restrictions in participation in PTSD raising serious concerns. There are unique patterns of association between objective participation dimensions, subjective cognitive indices, sensory modulation, and environmental factors, suggesting a need for PTSD feature-specific intervention approaches to advance the participation of those with PTSD as a means of promoting health and well-being.

KEYWORDS

objective participation, subjective participation, neurocognition, functional capacity, environmental impacts

1 Introduction

People with post-traumatic stress disorder (PTSD) of any origin experience a range of symptoms that significantly impact their daily lives, including restrictions in everyday functioning. Despite evidence of functional challenges ensuing from PTSD, there is a lack of comprehensive understanding of the wide occupational landscape in various areas and dimensions. Additionally, research on the factors that influence everyday functioning in PTSD is limited. In contemporary discourse, both objective and subjective dimensions of everyday functioning across a range of occupations are recognized as pivotal elements of health (1). Therefore, augmenting our comprehension of this issue in PTSD is essential, as it holds the potential to significantly contribute to the health, well-being, and recovery of this population.

PTSD is characterized by the intrusive re-experience of a traumatic event, dissociative reactions, psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event, negative alterations in cognitions, mood, arousal, and reactivity associated with the traumatic event, and avoidance (DSM-5; ICD-11) (2, 3). Prevalence rates for PTSD vary widely around the world (4), but Israel has one of the highest rates, 9% (5), these, in addition to a 2.6% prevalence of complex post-traumatic stress disorder (CPTSD) (5), which is evoked by repeated exposure to traumatic event(s) and/or of multiple forms (ICD-11) (3). With the impact on social, vocational, and other important areas of functioning, PTSD has, unfortunately, a low treatment rate (6).

1.1 Participation of those with PTSD

The World Health Organization (WHO) places everyday functioning in the context of participation——a multi-dimensional concept representing the involvement of people in all areas of life (1). There is evidence of disruption in participation including self-care, productivity, leisure, and social participation in PTSD (7, 8). Within the scope of self-care activities, sleep disorders consistently were addressed (8). In addition, there is evidence of the difficulties in managing and maintaining health (9). Among productive activities, complications with obtaining and maintaining employment most commonly were reported (8, 10), however, community mobility, safe driving, financial management, meal planning, school functioning, and parenting all were also found to be interrupted (8). Involvement in leisure activities of cultural entertainment (e.g., cinema), outdoor recreation, sports, and social activities was found to be reduced following PTSD (8, 11). Additionally, people diagnosed with PTSD experienced difficulty in creating and maintaining meaningful relationships within the community and with their spouses (12–14). Despite mounting evidence on restrictions in general indices of functioning or participation in specific areas of occupations, to the best of our knowledge, little research was done on the broad participation patterns of PTSD. Indeed, each area of participation brings its unique contribution to daily life, well-being, and health which are worthy of attention. For example, employment brings financial stability, social status, opportunities for social networking, health management, and skills retention and development (15). Leisure activities provide opportunities to find personal strengths and abilities, generate positive emotions, help minimize the impact of symptoms, find meaning in everyday life, and establish companionship and meaningful relationships (16, 17). Still, healthy participation patterns are characterized by ongoing intervening between occupations of different areas, which is particularly relevant for mental health (15). In addition, participation patterns include subjective aspects of involvement of the experience of involvement (18) and are of critical importance for health and well-being. For example, people with PTSD reported a lack of interest and decreased satisfaction with work and parenting (19, 20), and, in the case of leisure, a disconnection between the activities defined as leisure and the individual experience of leisure (21), all of which affected health and well-being. Even though issues of experience within participation were evoked through various studies (e.g., 16, 17), they have scarcely been a target for investigation.

1.2 Participation enablers for those with PTSD

Participation in daily life activities results from the dynamic interplay among personal cognitive, affective, and physical factors, environmental characteristics, and occupational features (22). However, the investigation into the interplay among these components concerning participation has been relatively limited in PTSD, even though evidence supports this notion (23). Previous research indicates the impact of the PTSD symptoms' severity and number on general indices of everyday functioning (24), vocational outcomes, parenting (25), and subjective and objective academic achievements (26), accounting for up to 42.9% of the variance (27). Specifically, symptoms that were found to be of relevance to the participation aspects are avoidance, emotional numbing, low motivation, stress, feelings of guilt, and fluctuations in arousal (28–30).

Coping with complications associated with PTSD necessitates resilience, which refers to the capacity to effectively confront significant adversity and adapt to it (31). Within the construct of resilience, self-efficacy——an individual's confidence in their ability to attain a desired goal with the help of available resources (32)——holds considerable significance (33). Self-efficacy emphasizes positive expectations and personal agency in overcoming obstacles, focusing on beliefs rather than actual actions (33). Still, due to its pivotal role in goal-directed activities, self-efficacy has been associated with actual functioning in serious mental health conditions such as schizophrenia (34) and depression (35). Research among trauma survivors has demonstrated a direct association between self-efficacy and PTSD symptom severity (36, 37), but its relationship with participation has not been extensively explored.

There is robust evidence of objective neurocognitive deficits in PTSD, primarily in executive functions, sustained attention, working memory, learning, and information processing speed (23, 38, 39, 61). These are in addition to self-reporting on cognitive impairments (23). Although there is limited research in the field, the existing findings reveal a relationship between cognition and general indices of occupational and social achievements (23, 39, 40). Functional capacity represents the ability to perform everyday living skills in a controlled environment, was previously reported to be a valuable predictor of participation, and was found to be altered in PTSD (30, 41, 42, 61).

Sensory modulation is defined as a neural process involved in the registering and interpreting of sensory stimuli from various modalities to generate appropriate behavioral and emotional responses based on context and individual needs (43, 44). A range of sensory modulation aberrations has been observed in PTSD, all of which share a common feature: a low threshold for sensory stimuli and interference with the inhibition process (45–47). These sensory alterations——sensory modulation disorder——have been found to correlate with the severity of PTSD symptoms (45, 47). However, to date, the association between SMD and functional outcomes in individuals with PTSD has not been thoroughly investigated.

Participation in daily life activities is contingent upon the attributes of the physical, social, cultural, and institutional environment in which individuals reside, and where occupations take place (1, 22), in addition to personal factors. From this standpoint, a thorough examination of participation should consider the environment as a determining factor since what facilitates one individual or occupation might present obstacles for another.

1.3 Study aims

In summary, limited research has explored the comprehensive construct of participation and enabling factors in PTSD (23). Given the importance of participation in occupations for health, well-being, and recovery in PTSD, this pilot study's aim was twofold: (1) to delineate the objective and subjective dimensions of participation across a range of areas in comparison to health controls; and (2) to comprehensively investigate personal and environmental factors that impede participation among individuals with PTSD of different source in Israel. This study may enhance understanding of potential mechanisms through which PTSD leads to restrictions in different dimensions of participation, and, may provide insights to guide the development of interventions aimed at promoting participation, health, and well-being.

2 Methods

This is a pilot cross-sectional and comparative study with a convenience sample of individuals with PTSD, matched by gender and age-healthy controls.

2.1 Participants

Sixty-one individuals participated in this study in two groups: those with PTSD (N=31) and healthy controls (N=30). Inclusion criteria for the PTSD group included (a) formal diagnosis of PTSD according to DSM-5 (2) and (b) men and women in the age range of 18–65. Exclusion criteria were (a) diagnosis of psychosis or mania; (b) current substance abuse; (c) significant neurological, physical, or developmental diagnosis that affects daily functioning; and (d) legal guardian. The control group (healthy controls – HC) included healthy volunteers recruited through convenience sampling from social networks. They were matched to the study group by gender and age. The inclusion criteria for this group were: (a) no history of neurological, neuropsychiatric, or motor health conditions according to self-report, and (b) no constant medication of any type, including analgetic. Those who were reported on neuroleptic medication in the past were excluded from the study.

The sample size was calculated based on known data from the literature on the relationship between functional capacity and a general cognitive score in PTSD (42). Given alpha = 0.05 and power of 0.85, N=29 was found (r = 0.48) (GPower software).

2.2 Measurements

2.2.1 Participation and functional capacity

The Adults Subjective Assessment of Participation (ASAP; 48) questionnaire was used to assess objective and subjective participation dimensions in 52 activities, by the following areas of occupation (categories): (1) domestic life; (2) entertainment and recreation; (3) care for children and other adults; (4) learning and applying knowledge; (5) sport and physical activity; (6) self-care; (7) quiet leisure; and (8) vocation. The participant is asked to rate for each activity the following objective dimensions: number of participated activities (diversity; 0–52); intensity/frequency (0–9), where (at home/outdoors); with whom (alone/with others); and subjective dimensions of enjoyment (1–6) and satisfaction (1–6). Final scores are calculated for each area of occupation and the whole questionnaire. The ASAP has satisfactory test-retest reliability ($0.553<r<1$) and construct validity that was established through a factor analysis ($2.12 <\text{eigenvalue}<5.79$). Discriminant validity was established by demonstrating differences between people with different disabilities and healthy controls ($3.12<F<7.67$) (48). In addition, we added the scale on the participation meaning based on the Meaningful Activity Participation Assessment (MAPA, 49). The scale was rated on the 6-point Likert scale (0-not meaningful; 5- most meaningful) with total score calculation like those of the MAPA.

USCD Performance-based Skills Assessment (UPSA; 50) was applied to evaluate functional capacity in five areas: medication management, financial management, using the telephone and communication, using public transportation, and planning leisure activities. This performance-based test comprises a simulation of 11 daily life tasks. The final score ranges from 0–100. The UPSA has acceptable test-retest reliability (r=0.74), criterion validity (r=0.86), convergent validity with cognitive tests (r=0.60 to r=0.79), and discriminant validity between different groups of mental diagnosis and healthy controls.

2.2.2 Personal factors

PTSD Checklist for DSM-5 (PCL-5; 51) is a self-report questionnaire for adults to evaluate the presence of PTSD symptoms, according to the 5DSM criteria. The questionnaire includes 20 items. For each item, the subject is asked to describe how much the described problem bothered him during the last month, on a 5-point Likert scale (0=not at all, 4=extremely). There is a final score of all items and subscale scores, that represent clusters of the PTSD symptoms: (a) intrusive thinking; (b) withdrawal symptoms; (c) changes in cognitive functions and mood; and (d) overstimulation. The cut-off score of 33 is used for the diagnosis of PTSD. Following psychometric properties were established for the tool: internal consistency (Cronbach $\alpha = 0.96$) and test-retest reliability ($r = 0.85$). Construct, discriminant, and convergent validity are established as well.

Pittsburgh Sleep Quality Index (PSQI; 52) was used to assess sleep quality and disturbances over a one-month time interval based on self-report. The questionnaires address subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, and use of sleeping medication. The sum of scores for the components yields one global score. The questionnaire has good internal consistency (Cronbach α=.83) and discriminating validity between a population with sleep disorders and a non-clinical population (53).

The General Self-Efficacy Scale (GSFS; 54) is a self-reporting questionnaire that assesses a person's general sense of mastery and capability. The questionnaire contains 14 items rated on a five-point Likert scale (1 = not at all, 5 = very much). The total score of the GSE has sufficient internal consistency (a=0.87-0.95) and concurrent validity (0.88-0.98).

Montreal Cognitive Assessment (MoCA; 55) was used for the evaluation of general cognitive functioning. The tool includes 30 items divided into 7 cognitive domains: (1) attention and concentration; (2) executive functions; (3) immediate memory; (4) language; (5) abstraction; (6) delayed memory; and (7) orientation. A sum score of 26 or higher is considered normal cognitive functioning. The MoCA demonstrates good internal consistency (α=0.83), criterion validity with additional cognitive tests, and discriminate validity indicating individuals with mild cognitive disorders (94.6%).

Trail Making Test, Parts A & B (TMT; 56) is a widely used paper-and-pencil test for speed of processing and mental flexibility. The completion time for each part was registered. There is a well-established test-retest reliability, internal consistency between the two parts, and concurrent validity.

Dysexecutive Questionnaire Self-reporting (DEX-S; 57) is a self-reporting questionnaire for adults to assess daily problems related to executive function impairment. DEX-S includes 20 items organized into 4 domains: emotion/personality, motivation, behavior, and cognition. The items are rated on a five-point Likert scale (0=never, 4=very often). The total score and domains' sub-score may be calculated for the instrument. DEX-S has internal consistency with an alpha coefficient of 0.85 and convergent validity.

The Adolescent/Adult Sensory Profile (AASP; 58) is a self-reporting questionnaire for adolescents and adults to assess impaired sensory processing patterns, based on Dunn (58) sensory processing model. The questionnaire includes 60 statements concerning each of the sensing systems, as represented in daily life situations. The individual reaction on how often there is a reaction to the described sensory event is scored with a five-point Likert scale (1=almost never, 5=almost always). The sub-scores address four sensory patterns based on normative data: (a) low registration; (b) sensory seeking; (c) sensory sensitivity; and (d) sensory avoidance. The questionnaire has well-established psychometric properties including internal consistency ($0.639<\text{Cronbach } \alpha<0.699$), discriminant and convergent validity. In this study, due to the small sample, we classify the sensory processing patterns into two groups: typical——similar to the average, or atypical——different from the average.

2.2.3 Environment

The Occupational Self-Assessment (OSA; 59), environment sub-scale was used to address individual perception of the environment properness to enable participation in various daily life occupations. The sub-scale contains 8 statements rated on a 4-point scale (1=very problematic, 4=excellent). The OSA questionnaire as a whole has good psychometric properties, while the environment sub-scale has established construct validity.

2.4 Procedures

The study was approved by the Helsinki Ethic Committee of the Mental Health Center affiliated with the Ministry of Health (approval number 5-21, 7.2.2021). All the participants provided written informed consent following an explanation of the study's aims and procedures. The PTSD group was recruited from ambulatory services (clinics, day hospitalization, and daycare) of the regional Mental Health Center that provides services to an expansive geographic area. The research team approached individuals who met the inclusion and exclusion criteria. Those who agreed to participate in the study and provided the consent were enrolled. The study procedures with the PTSD group consisted of a single 90-minute session, during which evaluations were conducted in a random order. Following the study, HC completed participation evaluation within the research protocol.

2.5 Data analysis

The data was analyzed with IBM's Statistic Package for the Social Sciences (SPSS), version 27. Descriptive statistics were used to characterize the study participants. The type of distribution was approved using the Kolmogorov-Smirnov test. To examine differences between the groups for demographic variables and participation indices, the Mann-Whitney test, t-test, or χ^2 tests were used, depending on the type of scale and the type of distribution. In addition, due to the small sample size, we used effect size metrics——Cohen's d. To test relationships between the study variables in the PTSD group, Pearson's correlation test was used for quantitative variables with normal distribution and Spearman's test for ordinal variables or quantitative variables with distribution different from normal. The level of significance in this study was set at 0.05.

3 Results

3.1 Descriptive statistics of the participants and main variables

The PTSD group comprised 31 individuals, both male and female (women: n=24, 77.4%), with ages ranging from 21 to 53 (M=34.25, SD=9.19). A significant portion of the participants had experienced violent childhood trauma, received a formal diagnosis from 0.5-up to 26.5 years ago (M=5.5, SD=5.7), taking medication, and was officially recognized by the National Insurance as disabled. The majority of participants in this group were single, had more than 12 years of education, held a profession, but had not been employed in the six months before the study, and predominantly resided with their families (Table 1). Nearly half of the participants were diagnosed with additional conditions such as personality disorders, depression, and/or anxiety disorders alongside PTSD and had a history of psychiatric hospitalization (Table 1).

The HC group included 30 participants, healthy to their report (without diagnoses of any mental or physical disorders), matched by age (M=33.57, SD=8.9; t(58)=0.73, p=0.942, Cohen's d=0.01) and gender (women: n=22, 73.3%; $\chi2(1)=6.53$, p=0.011) for the study group. However, a significant difference was found between the groups in education level was found between the PTSD group (M=13.47, SD=2.59) and the HC (M=15.4, SD=2.79) (t(58)=-2.774, p=0.007, Cohen's d=0.71).

TABLE 1 Demographic characteristics of the PTSD group (N=31).

		n	%
Family status	Single Married Divorced	18 6 7	58.1 19.4 22.6
Living situation	Alone With roommates Extended family Own family	4 3 15 9	12.9 9.67 48.38 29
Profession	Blue collar White collar No profession	13 3 15	41.93 9.67 48.38
Work in the previous half-year	Yes No	13 18	41.9 58.1
Social benefits	Yes No	27 4	87.1 12.9
Rehabilitation services	Yes No	17 14	54.8 45.2
Age of trauma	Childhood Adult	26 5	83.87 16.12
Secondary psychiatric diagnosis	Yes No	16 15	51.61 48.38
Previous psychiatric hospitalization	Yes No	15 16	48.4 51.6
Neuroleptic medication	Yes No	27 4	87.1 12.9

3.2 Participation: between groups differences

A significant difference was found between the groups in the participation intensity (t(58)=-2.42, p=0.018, Cohen's d=0.62) in favor of healthy subjects (PTSD: M=2.72, SD =0.86; HC: M=3.19, SD=0.62). However, the comparison by areas of occupation revealed that individuals with PTSD participated with a higher frequency in self-care activities (Figure 1). A significant difference was also found in the participation diversity (t(58)=-4.73, p=0.000, Cohen's d=1.22), where HC participated in a wider range of occupations (M=53.4, SD=11) than individuals with PTSD (M=39.23, SD=12.17). In addition, a significant difference was found in the percentage of activities that were given up (Z(128) =-4.76, p=0.000, Cohen's d=1.4), so that participants with PTSD gave up a higher percentage of activities (M=41.23, SD=12.37) compared to HC (M=19.77, SD=5.93). No significant difference was found between the groups in the percentage of activities performed alone (Z=-1.86, p=0.06; Cohen's d=0.46), and at home (*t*(29)=-.033, *p*=0.97, Cohen's d=0.38), and no differences were found in the subjective dimensions of enjoyment (t(58)=-1.61, p=0.11, Cohen's d=0.41) and satisfaction (total score) (t(58) =-7.47, p=0.46, Cohen's d=0.19). However, by-area comparison reveals significant differences in enjoyment and satisfaction between the groups in most areas of occupation in favor of HC (Figure 1). In addition, the primary location for carrying out occupations varied among the groups by area (Figure 1).

A level of assistance in participation and meaning was measured in the PTSD group only. The median level of assistance required to participate was found to be 2.66 (partial help/no-help) (interquartile range 2.38–2.9; the lowest level of assistance is 3 - no help). The mean experience of meaning in occupations was found to be low (M=338.1; SD=195.34; the maximum score is 1560).

3.3 Participation dimensions: correlation with personal and environmental factors

The correlation between participation dimensions and personal and environmental factors was investigated in the group of participants with PTSD. A negative correlation of moderate strength was found between the DEX-S and the participation intensity and diversity. Individuals with a higher level of difficulty in executive functioning reported lower participation intensity and diversity. A moderately strong negative correlation was found between the TMT-A score and enjoyment (see Table 2). Individuals with higher speed of visual processing reported higher enjoyment of participation. In addition, a strong positive correlation was found between the OSA score and participation diversity, and a moderate negative correlation between the OSA score and the percentage of activities that were given up. That is, individuals whose environment better matched their needs participated with greater diversity and relinquished a lower percentage of activities (see Table 2).

Significant differences were found in the participation intensity (t(27)=2.609, p=0.015, Cohen's d=1.06), the participation diversity (t(27)=2.517, p=0.018, Cohen's d=1.1) and meaning (t(27) =2.813, p=0.000, Cohen's d=1.3) between individuals with typical (N=7, 23.3%) and atypical sensory avoidance (N=23, 76.7%), so that the last participated with a lower intensity (M=2.49, SD=0.75), a lower variety of activities (M=36.88, SD=11.12), and experienced less meaning in the activities (M=293.09, SD=183.41), in comparison to typical sensory avoidance (intensity: M=3.39, SD=0.92; Diversity: M=48.9, SD=10.52; Meaning: M=506.71, SD=141.72). In the pattern of sensory sensitivity, no statistically significant difference was found in participation indices between subjects with typical (N=4, 13.3%) and atypical (N=26, 86.7%) sensory processing, possibly due to the presence of only four subjects with a score similar to the average. However, a tendency to a difference according to effect size was found in measures of meaning (Cohen's d=0.66), diversity (Cohen's d=0.68), and activities that were given up (Cohen's d=0.34). This finding may indicate that subjects with atypical sensory sensitivity may participate in a narrower variety, give up a higher percentage of activities as well as experience less meaning in occupations. In the sensory seeking scale, a significant difference was found in the percentage of activities performed alone (t(27)=-2.12, p=0.043, Cohen's d=0.93). Subjects with atypical sensory seeking participate in more activities alone (M=61.41, SD=16.9) compared to those with typical patterns (M=47.4, SD=12.62). No difference was found in the participation patterns between subjects with a typical and atypical low registration index (-1.0<t<1.08, p>0.05).

Correlational analysis examining the association between personal factors, demographics, and PTSD-related data is presented in Table 3. It was found that higher age was associated with lower general cognitive functioning. All cognitive performance-based tests and the functional capacity measure demonstrated convergence: higher performance in one test indicated higher performance in the others. Better results in the MoCA and the TMTb tests were associated with perception of the environment as more enabling. Finally, a higher level of PTSD symptoms was associated with lower self-efficacy.

4 Discussion

Participation in personally and community-meaningful occupations is an important element of health and well-being (1,

TABLE 2 Correlational analysis PTSD group: participation, personal factors and environment (N=31).

	Descriptives M(SD)/ Med(Range)	The Adults Subjective Assessment of Participation							
		Intensity	Diversity	Give-up activities	Activities Alone	Activities at home	Enjoyment	Satisfaction	Meaning
MoCA	27 (24-28)	-0.02	0.14	-0.15	0.32	0.18	0.07	-0.11	-0.11
TMTa	34.46 (10.82)	0-.14	-0.31	0.16	-0.09	-0.02	-0.40*	-0.25	-0.28
TMTb	70 (54-110)	.090	-0.27	0.16	0.06	0.06	0.15	0.35	0.03
DEX-S	33.24 (10.68)	-0.45*	-0.46*	0.20	0.31	0.05	-0.23	-0.22	-0.34
UPSA	50.44 (8.62)	.030	0.02	0.23	0.28	0.04	0.03	-0.24	-0.05
PCL-5	52.86 (10.6)	-0.09	-0.23	0.18	-0.21	0.14	-0.35	-0.30	-0.19
GSES	3.09 (0.88)	.270	0.16	-0.07	0.14	0.07	0.30	0.12	0.24
OSA	2.65 (0.56)	.100	.50**0	-0.44*	-0.30	-0.20	0.16	0.23	0.31
PSQI	6.67 (3.38)	.100	-0.07	0.17	0.47	0.25	0.03	0.15	0.05

*p<.05, **p<.01; DEX-S, Dysexecutive Questionnaire Self reporting; GSES, General Self-Efficacy Scale; MoCA, Montreal Cognitive Assessment; OSA, The Occupational Self-Assessment; PCL-5, PTSD Checklist for DSM-5; PSQI, Pittsburgh Sleep Quality Index; TMT, Trail Making Test A & B; UPSA, USCD Performance-based Skills Assessment.

TABLE 3 Correlational analysis PTSD group: personal factors, environment and demographic factors (N=31).

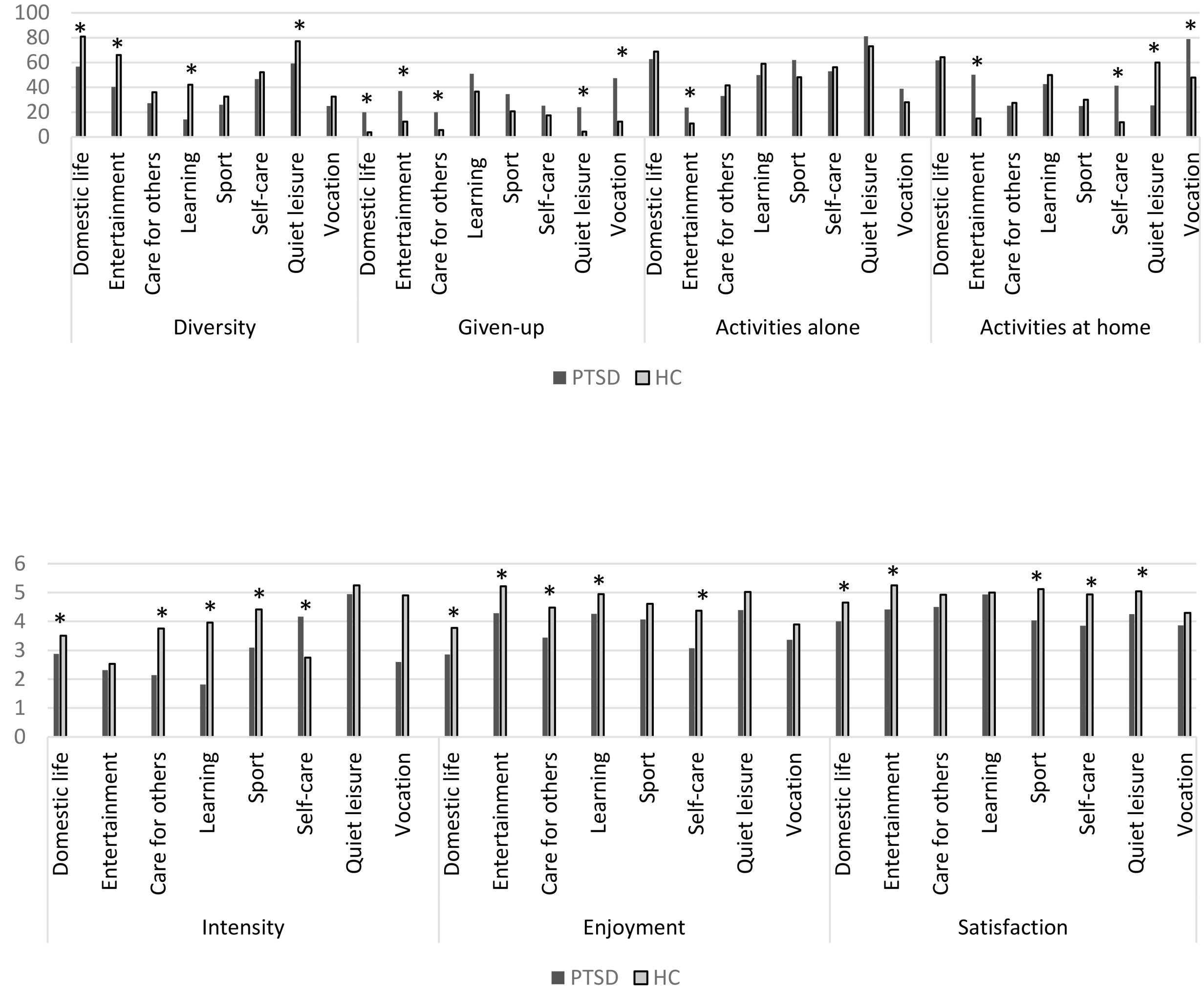
	Age	Education	Illness Duration	MoCA	TMTa	TMTb	GSES	DEX-S	PCL-5	OSA	UPSA
Age											
Education	0.05										
Illness duration	0.3	-0.138									

(Continued)

TABLE 3 Continued

	Age	Education	Illness Duration	MoCA	TMTa	TMTb	GSES	DEX-S	PCL-5	OSA	UPSA
MoCA	-.355*	0.115	-0.275								
TMTa	0.305	-0.046	0.157	-.455*							
TMTb	0.281	-0.147	0.212	-.604**	.582**						
GSES	-0.049	-0.121	-0.201	-0.085	-0.182	0.164					
DEX-S	-0.155	-0.208	-0.004	0.055	0.338	0.269	-0.268				
PCL-5	-0.118	0.054	-0.161	-0.040	0.187	-0.013	-.446*	0.268			
OSA	-0.237	-0.044	-0.114	.441*	-0.273	-.438*	-0.005	-0.083	-0.044		
UPSA	-0.221	0.174	0.025	.539**	-.388*	-.373*	0.076	-0.256	-0.075	-0.018	

*p<.05, **p<.01; DEX-S, Dysexecutive Questionnaire Self reporting; GSES, General Self-Efficacy Scale; MoCA, Montreal Cognitive Assessment; OSA, The Occupational Self-Assessment; PCL-5, PTSD Checklist for DSM-5; TMT, Trail Making Test A & B; UPSA, USCD Performance-based Skills Assessment.



Note: *p<.05

FIGURE 1
Objective and subjective participation dimensions by groups: PTSD (N=31) and healthy controls (N=30). *p<.05.

22). As such, the objectives of this pilot study encompassed the characterization of both objective and subjective participation dimensions in individuals with PTSD, as well as the exploration of the relationships between participation patterns and personal and environmental factors. The findings reveal a profound reduction in the objective participation dimensions of intensity, diversity, and the increase in abandonment of activities within the scope of occupation areas. Additionally, there is inferior enjoyment and satisfaction across a considerable number of occupation areas, which is further debilitating. Specific areas of occupation appear to be particularly susceptible to these reductions. The study disclosed factors related to objective participation dimensions, but not to subjective ones; findings that will be further discussed in light of theories and research in the field.

4.1 Participation in PTSD

The novelty of this study is a comprehensive delineation of the participation patterns in a range of occupation areas. In line with previous findings on general functional indices (7, 8), an in-depth investigation of participation demonstrates that at a glance, people with PTSD gave up a higher number of activities than healthy controls, and participated in a limited variety of occupations with decreased intensity. Further analysis by occupation areas reveals a pronounced reduction in participation diversity in domestic life activities, leisure activities of entertainment, learning and applying knowledge activities, and, even, quiet leisure activities. In this way, the findings further support the existing literature on specific areas' limitations (8, 10). But even more important, the study demonstrates that the reduction in diversity occurs horizontally in many areas of occupation, rather than selectively in one area at the expense of others, as may be assumed based on previous research on discrete areas of occupation, such as employment. The vulnerability of the participation patterns in PTSD is even more profound, given the findings on lower general frequency in participation, stemming partially from the same areas with reduced diversity, such as domestic life activities and learning and applying knowledge, but also encompassing additional areas of occupation of taking care of children and others, and leisure physical activities and sport. These findings further expand understanding of the extant participation alterations in PTSD, refuting the assumption that the participation diversity limitations are compensated with the frequency of participation, i.e. people do fewer activities but with higher frequency.

Despite the general reduction in the participation patterns, the study disclosed the complex picture of the participation of those with PTSD arguing for additional investigation. For example, the frequency of taking care of one's own health was found to be higher in those with PTSD than in the healthy control, reflecting the unique patterns of this population. In addition, even though in general, the locus of participation of individuals with PTSD was similar to healthy, by-area analysis reveals inversion in prevalent places for carrying out activities. Unlike healthy participants, individuals with PTSD engaged in significantly higher percent of entertainment, vocational, and self-care activities at home, while less of their quiet leisure activities occurred at home. Different environments can reflect the choice or lack of choice of the people. Still, in both cases, it determines different supports, opportunities, and requirements, intervening substantially with the participation. The participation patterns in PTSD raise even more concern given the findings on greater abandonment of occupations, suggesting that the limitations may be progressive. It is important to note, that occupations were waivered in areas that have been found to be deficient based on other indices: domestic life, leisure activities of entertainment, taking care of children and others, and quiet leisure activities, delineating the particularly susceptible areas of occupations.

Unexpectedly, the summary score of subjective participation dimensions of enjoyment and satisfaction was found to be similar between healthy individuals and those with PTSD. The results may indicate that actual participation in occupations can serve as a preventive factor against alterations in participation experience. Still, the areas analysis reveals that both enjoyment from the participation and satisfaction with it was inferior for individuals with PTSD in a range of investigated areas, including domestic life, self-care, and leisure activities of entertainment. In addition, we found lower satisfaction with sports and quiet leisure activities and lower enjoyment from participation in occupations of caring for children and others, and learning. These findings may represent the impact of core trauma mechanisms on participation as they are obstructive to positive emotions and cognitive appraisal (DSM-5) (2). Or, in the case of satisfaction, the results may reflect the dispersion between actual participation and capacity and/or expectations.

Overall, the findings indicate that PTSD posed restrictions on most objective and subjective participation dimensions in both more obligatory and structured occupations (e.g., domestic life activities) and occupations of personal choice and preference, such as leisure. The importance of this understating should be discussed in light of the role of these two clusters of occupations in life and efforts to detect possible pathways for advancing participation. Although there are certain differences in their roles, both clusters of occupations enhance confidence, self-esteem, and sense of control, and provide a platform for skill development and maintenance, including coping with stress and disability (15, 60). Domestic life activities enable independence in everyday life, ensure satisfaction of basic needs, have standards for performance, supporting instrumentally participation in additional areas (15). For example, independence in transportation is an important enabling factor for employment, leisure, and social participation. Whereas practicing leisure activities brings unique meaning that cannot be obtained through other occupations: it enables a sense of freedom and provides opportunities for self-expression, social engagement, and connection, and for physical and mental relaxation from obligations and routines (60). Thus, limitations in both clusters of occupations place individuals with PTSD in an unfavorable position as to their health and well-being. Next, based on features of these occupations, it is less likely to be assumed that general participation promotes strategies such as occupational structuring (e.g., through rehabilitation services) or enables unlimited access to a wide range of occupations (e.g., through social welfare programs), resulting in a breakthrough and fostering participation among this population. Still, there are encouraging findings, since no differences were found between the extent of participation with others versus alone, implying that drawbacks of loneliness in participation may be less prominent in PTSD.

4.2 Enablers for participation

Our findings contribute to disclosing possible mechanisms facilitating objective and subjective participation dimensions. First, we found that both diversity and intensity of participation were associated with individual appraisal of executive and emotional dysregulation in daily life situations. The study expands previous literature, approving the association between self-perception of skills and comprehensive measurement of participation, over general functional indices or disability scores, and demonstrating this phenomenon for individuals with cognition and functional capacity within normal range. These, while previous studies involve people with impaired cognition (39, 42, 61). In discrepancy with some previous studies (39), objective participation dimensions were unrelated to cognitive performance as well as functional capacity. The findings imply the importance of self-perception of skills and competencies for participation, rather than their actual level in PTSD. Or, it may be suggested that self-reporting may be more sensitive than objective tests to the change that occurs following trauma. Moreover, we demonstrated that functioning-specific self-perception was of importance for participation, rather than the estimation of general self-efficacy which was found to be detached from the participation. Still, caution is needed since the objective participation was measured in this study based on self-report, thus it might be assumed that the findings replicate previous studies in PTSD on convergency between self-reported tools, but not with performance-based ones (23, 42, 61).

Next, we found sensory modulation alterations of all types of combinations between the sensory threshold (low versus high) and behavioral patterns (active versus passive) in our cohort, indicating a prevalent pattern of passive behavior either for a low or high sensory threshold or active behavioral avoidance in the case of low threshold. These findings further expand previous literature on SMD in PTSD (45). Innovatively, this study found an association between sensory alterations and participation limitations, disclosing distinctive characteristics of the population with PTSD; as in other serious mental diagnoses, this association has been hardly found (43, 44). We first provide research evidence for intuitive assumption in PTSD demonstrating a link between active avoiding behavioral response due to low sensory threshold——sensory avoidance, lower diversity, and intensity of participation in daily life. We also reveal that individuals who minimize their behaviors, even though there are high sensory thresholds, find themselves participating more alone, and individuals with sensory sensitivity, which represents passive behavioral strategies to a low sensory threshold, waiver on more occupations and participate with inferior diversity. These findings disclose an additional role of sensory disorder in PTSD, being not only an integrated part of symptomology (45) but also a hindering factor for participation and reintegration in daily life.

Human and non-human environments were found to be supportive factors for the objective participation in PTSD. The environment had been addressed in PTSD mostly through the lens of the source of trauma, symptomology, and interpersonal relationships (62). Environment provides instrumental means for participation in occupations of self-care, productivity, leisure, and social context through attitudes toward occupation and emotional support (1, 63). Extending previous research on various health conditions (63, 64), our findings suggest the critical role environment plays in PTSD. This impact may be beyond personal factors, but such an assumption should be further approved by the research.

Interestingly, in discrepancy with the previous studies (24–27), we found that the severity of PTSD symptoms and sleep disturbances were not associated with objective participation dimensions, even though the symptom levels were quite high in the study's population (51). This significant disparity may stem, again, from the difference in the participation evaluation (comprehensive in-depth evaluation versus brief general index (23, 27) and study population: those exposed to trauma (e.g., 27) versus those with a formal diagnosis. These findings suggest that the symptoms' alleviation may not enhance participation in a wide range of life areas for those who developed PTSD with moderate symptom severity.

Additional surprising findings are that neither symptom severity nor self-efficacy and self-reported measurement of executive and emotional dysregulation were associated with subjective dimensions of participation satisfaction, enjoyment, or meaning. Only the measurement of complex attention and speed of processing was found to be associated with enjoyment. We assume that these findings reflect the quality of fulfillment of the questionnaire, rather than indicate a credible phenomenon. Indeed, we found that performance-based measures (i.e., cognitive and functional capacity) show convergence, whereas most of the results from self-reported tools were not significantly related to each other. Given the vulnerability of the subjective dimension in PTSD that was found and its importance for health and well-being, the results raise a concern. Further research is needed to advance the modeling of subjective participation dimensions since current theoretical and research insights on factors intervening with these dimensions in PTSD are deficient.

4.3 Limitations

There are several limitations in this study. The study groups were matched by age and gender; however, they were found to be different for the level of education. Since education may affect participation, we recommend addressing it in future studies. In addition, the control group was recruited based on self-report on intact health, while no cognitive and other tests for health-related conditions were managed. It is recommended that in future studies, health status be confirmed through medical charts and health-related measures, including measures similar to those of the study group, be included in the study procedures to ensure the eligibility of participants for the control condition. Next, considering the limited convergence between self-reported tools, as well as between self-reported and performance-based measures, we recommend further investigation into the interplay between different constructs in PTSD and the impact of different measurement approaches. Still, the most deliberating limitation is a relatively small number of participants in the PTSD group. Given numerous comparisons that were done in the study, the study enables indication of trends rather than well-established conclusions. Additionally, the small number of participants with PTSD might be of particular effect for specific analysis, such as in the case of SMD, while the differences were investigated within the PTSD group only. Another issue that may have an impact on the generalization of the study's findings is diagnostic criteria since individuals with several sources of trauma within different timelines were enrolled in the study.

4.4 Conclusions

To summarize, individuals with PTSD have unique participation patterns and unique enablers for participation. Participation limitations followed coping with PTSD are inclusive, involving objective and subjective dimensions, of both obligatory and non-obligatory occupations. This situation is of particular concern regarding health, well-being, and recovery opportunities following PTSD. Given the extensive participation restrictions, it may be assumed that general rehabilitation and intervention strategies for the participation promotion may be less effective for populations with PTSD. Therefore, intervention approaches, dedicated to address unique challenges of this population, are required. Based on the results of this study, it is recommended to consider addressing individual appraisal of cognitive functioning, sensory modulation, and environmental factors as facilitators for objective participation dimensions, rather than focusing solely on the severity of PTSD symptoms, objective cognitive performance, or functional capacity. Additionally, it should be noted that subjective dimensions of participation remain largely unexplained by the study's variables and are poorly understood, which limits interventions aimed at promoting these dimensions. Given the nature of this pilot study, further large-scale research is needed on participation in PTSD to alleviate its impact on health and well-being.

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 humans were approved by The Jerusalem Mental Health Center, The Ministry of Health, Israel. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

RS: Formal analysis, Investigation, Writing – original draft. YBG: Data curation, Investigation, Writing – review & editing. LL-V: Conceptualization, Formal analysis, Methodology, Supervision, Writing – review & editing.

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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

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Factors encouraging participation in social activities after hospital discharge in people with severe mental illness who received occupational therapy

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Introduction: Occupational therapy (OT), a vital part of psychiatric rehabilitation, encourages participation in social activities, which is critical for the recovery of people with severe mental illnesses (SMI). However, the effects of OT on the subsequent social activities of patients with SMI have not been fully clarified. We aimed to identify the factors that encourage post-discharge social activity participation among patients with SMI who received OT.

Method: Patients who underwent OT at the Kyorin University Hospital between April 2016 and March 2020 were retrospectively examined for baseline data during hospitalization and social activity status 1 year after discharge. Occupational support, group adaptation, artistic activities, and exercise programs were considered. Activities requiring social interaction were defined as social activities, including employment, schooling, sheltered work, and volunteer work. Multiple logistic regression analyses using demographic and medical data, prehospitalization social activity status, and OT participation rates as independent variables were used to examine the factors encouraging social activity participation after discharge. Decision tree analysis was conducted to identify patients who specifically needed to increase OT participation.

Results: Of 524 eligible patients, 247 were included in the study. The number of patients who were socially active at admission and after discharge was 116 and 188, respectively. Multiple logistic regression analyses revealed that the following factors were likely to encourage social activity participation after discharge: higher rates of OT participation to facilitate group adaptation (OR = 1.015, 95% CI 1.003–1.027), being socially active at admission (OR = 4.557, 95% CI 2.155–9.637), and no marital history (OR = 0.293, 95% CI 0.130–0.661). Decision tree analysis showed that for patients who were socially inactive at admission and had a history of marriage, increasing OT participation to 52.6% or higher may ensure social activity participation after discharge.

Conclusions: This study identified patients whose social participation after discharge could be boosted by OT that facilitates group adaptation. Our findings would facilitate the development of individualized add-on rehabilitation based on the effects of real-world OT practices.

KEYWORDS

occupational therapy, psychiatric rehabilitation, recovery, severe mental illness, social activities

1 Introduction

People with severe mental illnesses (SMI) often find themselves distanced from the social activities they wish to join or those suggested by others (1–4). They typically require support to reintegrate into social activities, especially after hospitalization. Building connections through these activities is essential for personal recovery (5). Moreover, procuring employment — a crucial form of community involvement — enhances the quality of life of people with SMI (6, 7) and can help reduce healthcare costs by potentially preventing rehospitalization (8). However, people with SMI, who are prone to social withdrawal or disconnection, often face challenges re-engaging in social activities after hospital discharge (9–11). Consequently, consistent mental health treatment is paramount to bridging their return to social activities, although many tend to discontinue such treatment (12). Such adverse outcomes are more likely to occur in the period immediately following hospital discharge. In a systematic review, Mutschler et al. (13) identified that discharged patients experienced seven shortfalls, including “self-care as a coping strategy” and unfavorable “external factors.” “Self-care as a coping strategy” included “meaningful activity” and voluntary work, hobbies, making social contacts, and returning to work. However, this study showed that patients experience difficulties searching and finding these activities.

In-patient rehabilitation plays a crucial role in supporting people with SMI to continue mental health treatment and rejoin social activities. Killaspy et al. (14) conducted a 12-month prospective observational study with a cohort of patients admitted to quality-assured rehabilitation units in England. The study included 329 patients, 68% of whom were diagnosed with schizophrenia. During the study period, 70% of patients were either discharged or ready for discharge, with evidence of an associated reduction in cost of care. Similarly, Bunyan et al. (15) conducted a retrospective study with a cohort of patients from three in-patient rehabilitation units. The study involved 22 patients, including 13 patients with schizophrenia. The researchers found that the number of admission days and bed costs significantly decreased over a 2-year period following admission to the in-patient rehabilitation units, compared to that prior to admission. Guidelines from the National Institute for Health and Care Excellence emphasize the importance of staff attitudes and the structure of programs concerning recovery-oriented rehabilitation services for complex mental states (16).

Occupational therapy (OT) is an integral part of mental health rehabilitation services. Two systematic reviews have shown that there is strong evidence for the community reintegration of patients with SMI and the improvement of symptoms in patients with depression in an OT program structure aimed at return to work (17, 18). Additionally, the efficacy of OT in aiding people with SMI, especially schizophrenia, has been well documented, from improving psychiatric symptoms and cognitive functions to enhancing patient quality of life and interpersonal skills (19–22). These studies have highlighted the impact of OT on specific functions in patients with chronic schizophrenia who were hospitalized for an average of over 5 years. Research on patients with an average hospital stay of less than three months emphasized the importance of meaningful occupation in ensuring a positive hospital experience and successful reintegration post-discharge (23). In addition, people with schizophrenia who participated in individual OT during hospitalization continued to improve their social functioning for 5 years after discharge (24). A scoping review of OT in acute care psychiatric short-term hospitalization units showed that group interventions and spiritual aspects had a positive impact on quality of care and meaningful daily life for patients (25). However, these studies did not provide specific outcomes after discharge. Moreover, while there are many reports showing the effectiveness of OT as an add-on intervention implemented in a research setting, there is limited understanding of the effectiveness of real-world OT practices implemented at baseline.

A specific outcome after discharge is a compelling fact of the effect of the intervention performed during hospitalization. There is a gap between OT practices during hospitalization that support a positive inpatient experience, alleviate psychiatric symptoms, improve cognitive and social functioning, and provide a spiritual aspect, and those that keep the patient active in society after discharge. For real-world OT practice with inpatients to truly contribute to patients’ social activity, it is necessary to investigate real-world OT factors related to specific outcomes after discharge. To further develop the individualized add-on OT programs described in previous studies, it is necessary to identify the characteristics of patients with SMI who need enhanced real-world OT.

Therefore, we aimed to evaluate the post-discharge outcomes of patients with SMI who underwent OT during hospitalization in an acute care university hospital. Notably, we examined their participation in social activities within 1 year of discharge to determine the factors that promoted social activity and the hierarchy among the factors, and to identify patients with SMI for whom OT practices should be intensified.

2 Materials and methods

2.1 Patients

This was a retrospective analysis of post-discharge outcomes for patients with SMI who engaged in OT programs during hospitalization at an acute care university hospital. In this study, patients with SMI were defined as patients with psychiatric disorders requiring acute inpatient care (8). Patients admitted to the Department of Neuropsychiatry at Kyorin University Hospital between April 2016 and March 2020 who received OT were included in this study. The exclusion criteria were: (a) the patient was not admitted for treatment purposes but for examination to confirm their psychiatric diagnosis and (b) the patient was transferred to other facilities without any follow-up visits to our hospital; in other words, all patients included in this study attended our outpatient department after discharge. A portion of this sample was included in a previous study on employment attainment factors in people with mood disorders who participated in an occupational support program (26). This study was approved by the Ethics Review Committee of Kyorin University School of Medicine (Approval number: R03-095).

2.2 Occupational therapy for mental disorders

The OT programs were conducted in group sessions with approximately 10 participants and two occupational therapists. The programs were conducted according to patients' conditions, treatment goals, and personal preferences. Consequently, the initiation timing of the program varied between participants. Therefore, the demographic compositions of the OT groups were diverse and uncontrolled regarding the diagnosis of psychiatric disorders, gender, or age. The OT programs comprised four types, each administered once a week in a 2-hour session: occupational support program (OSP) (26), seasonal activity program (SAP), artistic activity program (AAP), and exercise program (EP).

The primary aim of the OSP was to evaluate participants' cognitive function and work performance, aiming to enhance the competencies they would need for rejoining the workforce or resuming academic pursuits (26). As cognitive tasks, patients played a bingo game in which they were asked to name the words they could think of that corresponded to a given theme, and solved a puzzle of geometric figures. Patients were then asked to transcribe a newspaper in timed segments and count the number of transcribed letters and misspelled words to encourage self-monitoring of their fatigue level. This program was designed as an independent activity so that it could be established even if patients participated only once. Patients who continued to participate were asked to draw a graph of the number of letters they transcribed and their level of fatigue to visualize the changes.

The main objective of the SAP was to foster group adaptation. The key activities included walking through the hospital garden and engaging in seasonal crafts. During the walk, everyone walked at the pace of the patients with the least walking ability, taking their time to enjoy the seasonal flowers, plants, and trees. Seasonal crafts were performed by all patients; one paper picture was to be completed approximately six times, comprising one session. Depending on the patient's state of recovery, their roles consisted of a single task, such as cutting paper with their fingers, cutting paper with a tool, or pasting paper onto the mount. Patients who were easily fatigued because their severe psychiatric symptoms had just subsided were allowed to simply be present without taking on an active role. In addition, to facilitate interaction among the patients, staff members reflected on the walk and brought up the topic of the design of the mount.

The AAP aimed to assess and bolster participants' executive function and occupational performance while encouraging the cultivation of interests. Its core component allowed participants to prepare and engage in activities selected from a pool of over 20 options tailored to their individual schedules, thus ensuring personalized participation. Optional activities were those that could be completed in a minimum of one session and a maximum of four sessions, including traditional origami, coloring, scratch painting, sewing, leatherworking, cord-working, and tile mosaic, among others. The tools and materials needed for the activities were placed in one corner of the room, and patients had to prepare and clean up on their own and offer help to the staff if they did not understand. In addition, patients introduced themselves to the group before the activity began and explained the activity they had performed at the end.

The EP-integrated group underwent stretching and paired light circuit training. The objectives of this module were twofold: to sustain and enhance participants' physical well-being and stimulate interpersonal engagement. The program was set up independently so that it could be established even if a patient only attended one session, and the content was the same each time. Stretching was performed in a chair-sitting position, with one of the occupational therapists positioned relative to the patients as the leader, and the patients imitated the leader's movements. The following items were arranged for circuit training: a 15-cm step stool going up and down, a 3-kg ball delivered backward by trunk rotation, flexion and extension of the upper limbs with bands of varying strength, and air cushion standing and foot stomping. Patients paired up, counted each other's steps in the step up and down, passed the ball to their partner according to their trunk rotation limits, adjusted the band to match their partner's ability, and helped their partner beside the air cushion to prevent them from falling over.

2.3 Study design and survey contents

In this study, we retrospectively examined medical and OT records. For patients who were hospitalized more than once during the study period, information was obtained from their last admission. We collected the following demographic and clinical variables at baseline: gender, age at discharge, academic degree, marital history, social activity status at admission, diagnosis of psychiatric disorder, duration of psychiatric disorder, Global Assessment of Functioning (GAF) scores, number of psychotropic types, admission period, and number of past hospitalizations. The participation ratio of each OT program relative to patients' length of hospitalization was recorded. Diagnoses of psychiatric disorders were categorized as follows: neurodevelopmental disorders (e.g., intellectual disability, autism spectrum disorder, attention-deficit/hyperactivity disorder), schizophrenia spectrum (e.g., delusional disorder, brief psychotic disorder, schizophrenia, schizoaffective disorder), mood disorders (e.g., bipolar and related disorders, depressive disorders), major neurocognitive disorders (e.g., various dementias), and others (e.g., anxiety disorders, obsessive-compulsive and related disorders, trauma- and stressor-related disorders, dissociative disorders, somatic symptom and related disorders, feeding and eating disorders, sleep-wake disorders, substance-related disorders, personality disorders). The primary outcome was engagement in social activities within 1 year post-discharge. Each patient's social activity status (at admission or within 1 year post-discharge) was identified from the psychiatrist's description of the patient during the interview (at the inpatient department or outpatient department). Because there were patients who commuted to work or school from the psychiatric ward—to ensure that they would remain in good standing at work or school prior to discharge—and the dates on which patients described their participation in social activities were not strictly the dates on which they had participated in them, the number of days to achieve participation in social activities was not investigated. Social activities were defined as employment or academic pursuits, job seeking or utilization of social services (27), self-employment or farming, and voluntary roles or hobbies necessitating interactions and negotiations with others. Based on these criteria, the patients were divided into two groups: those who implemented social activities during the first year after discharge (social activities group) and those who did not (non-social activities group).

2.4 Statistical analysis

Demographic, clinical, and OT-related variables were presented using descriptive statistics. Multiple logistic regression analysis was used to identify factors predicting post-discharge social activity engagement. We preliminarily analyzed descriptive statistical variables and incorporated gender, age, academic degree, marital history, GAF score, duration of disorders, social activity status at admission, and participation rates in the four OT programs into a stepwise selection process for the multiple logistic regression analysis. For the variable entry method, forced entry was used for the diagnosis of psychiatric disorders, while a stepwise selection method was applied for other variables exhibiting a potential difference ($p < 0.5$) between the social activity and non-social activity groups. Subsequently, a decision tree analysis utilizing the classification and regression tree (CART) algorithm was conducted to elucidate the hierarchical interrelationships of factors influencing post-discharge social activity status and identify patient groups that needed increased OT participation. CART aims to discern mutually exclusive subgroups within a population sharing characteristics that influence a particular dependent variable and demands the preliminary determination of independent variables (28). In the decision tree analysis, the dependent variable was post-discharge social activity status. Contrarily, the independent variables were those statistically identified as potential predictors in the multiple logistic regression analysis. To regulate the tree size and establish a meaningful minimum size, the tree's depth was determined to be equivalent to the number of independent variables. The minimum number of cases required for a node was set based on the least frequent category of post-discharge social activity status divided by the maximum permissible node growth. The minimum value on the Gini improvement scale was set at 0.001 to signify a marginal distinction between nodes. A significance level of 5% was used for multiple logistic regression analysis and decision tree analysis. All analyses were conducted using SPSS software for Windows (version 28.0.0.0, IBM Corporation, Armonk, NY, USA).

3 Results

Of the 524 patients who underwent OT during hospitalization, 165 who were transferred at discharge or within 1 year of discharge and 112 who were admitted for examination to confirm their psychiatric diagnosis were excluded; 247 were included in the study. Of the patients included in the study, 174 were female, 153 did not have a bachelor's degree, and 148 had been married; the median age at discharge was 50 years. The most common psychiatric diagnosis was mood disorders (96 patients), followed by others including anxiety disorders (68 patients), schizophrenia spectrum (51 patients), neurodevelopmental disorders (19 patients), and neurocognitive disorders (13 patients). The median GAF score for the entire patient population was 25.

The number of patients who participated in social activities after discharge from the hospital was 188: 63 engaged in employment or academic pursuits, 89 in job seeking or utilization of social services, 5 in self-employment or farming, 4 in voluntary roles, and 27 in hobbies. Of the 116 patients who were socially active at admission, 105 (90.5%) remained socially active after discharge. Contrarily, among patients who were socially inactive at admission, 83 (63.4%) engaged in social activities after discharge: 6 engaged in employment or academic pursuits, 52 in job seeking or utilization of social services, 2 in self-employment or farming, 2 in voluntary roles, and 21 in hobbies.

The total OT participation rates were 31.8%, 38.9%, 43.4%, and 36.8% in the OSP, SAP, AAP, and EP, respectively. Descriptive statistics for the demographic, clinical, and OT-based variables are presented in Table 1.

3.1 Multiple logistic regression analysis

When the diagnosis of psychiatric disorders was forcibly entered, a stepwise reduction in variables based on preliminary

TABLE 1 Characteristics of socially active and socially inactive groups during the first year after discharge.

Factors		Total n = 247	Social activities group n = 188	Non-social activities group n = 59	p-values	
Demographic characteristics						
Sex	Male: female	73: 174	63: 125	10: 49	0.010	*
Age at discharge (years)	median (min-max)	50.0 (16–88)	46.5 (16–88)	60.0 (19–83)	0.006	†
Academic degree	University graduate: less than	87: 153	71: 113	16: 40	0.128	*
Marital history	Yes: None	148: 98	100: 87	18: 11	< 0.001	*
Social activity status at admission	Yes: None	116: 131	105: 83	11: 48	< 0.001	*
Clinical characteristics						
Diagnostic classifications	ND: SS: MD: MN: Others	19: 51: 96: 13: 68	15: 40: 71: 10: 52	4: 11: 25: 3: 16	0.975	*
GAF	Median (min-max)	25 (5–45)	25 (10–45)	25 (5–40)	0.278	†
Number of psychotropic types	Median (min-max)	2 (0–4)	2 (0–4)	2 (0–4)	0.774	†
Duration of disorders (years)	Median (min-max)	6.0 (0–48)	5.5 (0–47)	8.0 (0–48)	0.373	†
Admission period (days)	Median (min-max)	57 (3–616)	57 (3–616)	61 (14–115)	0.854	†
Number of past hospitalizations	Median (min-max)	1 (0–18)	1 (0–18)	2 (1–9)	0.529	†
Participation ratio in occupational therapy (%)						
Occupational support program	Median (min-max)	31.8 (0.0–100)	38.9 (0.0–100)	12.3 (0.0–90.3)	0.012	†
Seasonal activity program	Median (min-max)	38.9 (0.0–100)	41.4 (0.0–100)	31.8 (0.0–100)	0.126	†
Artistic activity program	Median (min-max)	43.4 (0.0–100)	44.0 (0.0–100)	40.4 (0.0–100)	0.435	†
Exercise program	Median (min-max)	36.8 (0.0–100)	38.2 (0.0–100)	31.8 (0.0–100)	0.397	†

ND, neurodevelopmental disorders; SS, schizophrenia spectrum; MD, mood disorders; MN, major neurocognitive; Others, anxiety disorders and other included disorders; GAF, Global Assessment of Functioning.
*: Chi-square test.
†: Mann–Whitney U test.

analysis highlighted that marital history ($p = 0.003$, OR = 0.293, 95% CI 0.130–0.661), social activity status at admission ($p < 0.001$, OR = 4.557, 95% CI 2.155–9.637), and SAP participation rate ($p = 0.015$, OR = 1.015, 95% CI 1.003–1.027) were significantly correlated with post-discharge social activity status. Specifically, those who had never been married more than those who had been married, those who participated in social activities more than those who had difficulty at the time of admission, and those who participated more in SAPs were more socially active after discharge. Omnibus Tests of Model Coefficients confirmed statistical significance ($p < 0.001$). The Hosmer–Lemeshow goodness-of-fit test yielded a value of 0.432, which accurately predicted 77.7% of the outcomes.

3.2 Decision tree analysis using the CART algorithm

Based on the results of the multiple logistic regression analysis, the decision tree analysis considered marital history, social activity status at admission, and the SAP participation rate as independent variables. We limited the depth of the decision tree to three and established a minimum number of cases per node of 10. The resulting classification and regression tree are illustrated in Figure 1. The most influential factor affecting post-discharge social activity was social activity status at admission. Furthermore, among those who were not engaged in social activities at admission, both marital history and SAP participation rates influenced post-discharge social activity status. The SAP participation rate varied according to marital history. All patients who were not involved in social activities at admission and who were never married but participated in 43.6% or more of the SAPs engaged in social activities after discharge. Contrarily, within the node featuring an SAP participation rate of 43.6% or less, six patients still participated in post-discharge social activities.

4 Discussion

To the best of our knowledge, this study represents the largest sample size investigation of the determinants influencing post-discharge engagement in social activities for individuals with SMI

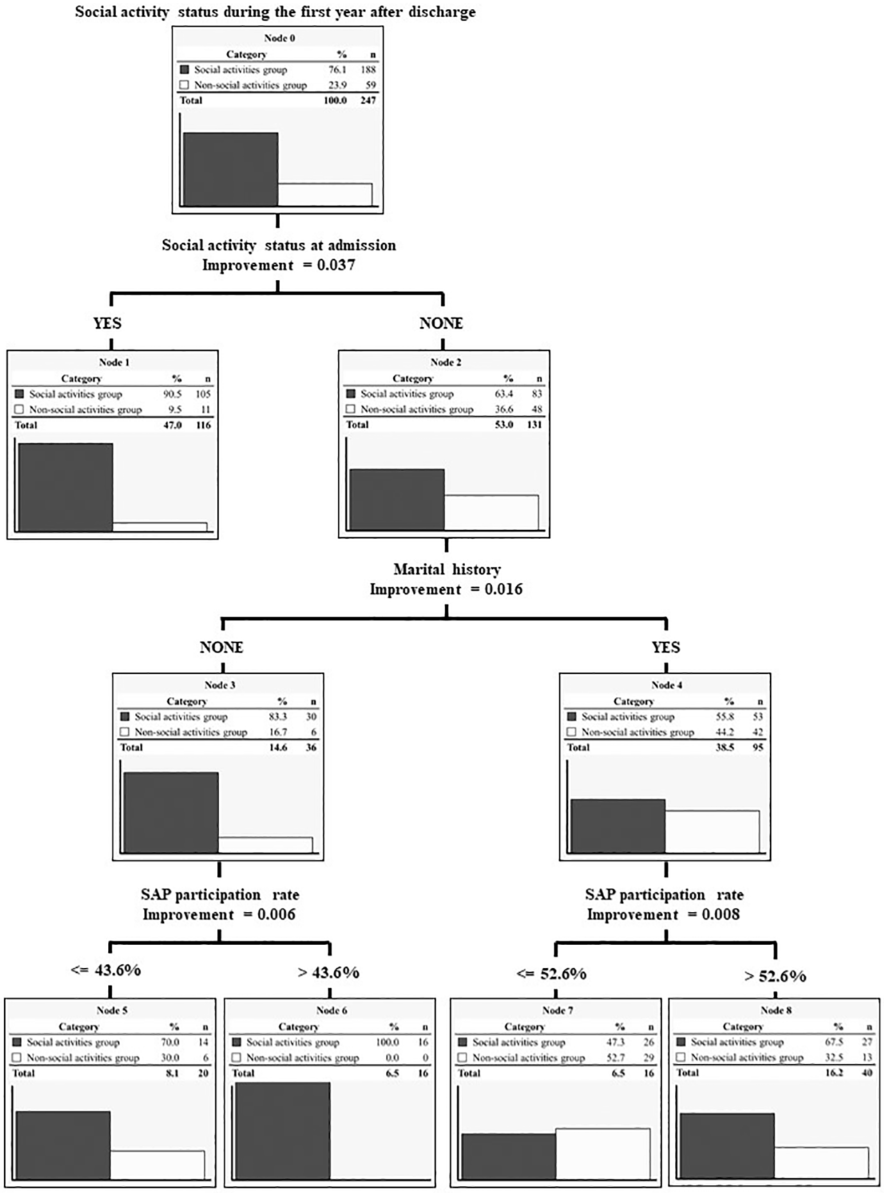

FIGURE 1
Hierarchy of predictors by the CART algorithm. A hierarchy of three factors extracted by multiple logistic regression analysis is presented. SAP, seasonal activity program (based on OT).

who received OT during hospitalization in an acute-care university hospital. Furthermore, no other study has used real-world OT practices, which are difficult to populate with a single disorder, to identify the content of OT programs that enable meaningful social participation after discharge and the patient population for whom OT participation needs to be increased. Our findings indicate that OT, particularly programs emphasizing group adaptation, enhances patients' preparedness for social activities. OT aimed at group adaptation for inpatients can encourage patients to become socially active, especially those admitted in a socially inactive state. Such OT participation rates may vary depending on marital history. The results of this study contribute to the investigation of patient-specific add-on rehabilitation based on the effectiveness of real-world OT practices.

Patients who actively participated in an OT program that facilitated group adaptation were more likely to engage in the defined social activities within the first year of discharge. A crucial element for community reintegration among people with SMI is the development of a sense of community underpinned by feelings of belonging and connectedness (29, 30). Such experiences during hospitalization may be pivotal for post-discharge involvement in social activities. Among inpatients with depression who participated in an OT group using activities, some reported that the activities allowed them to experience "belonging," "sharing while doing," and "opening up, which relieved pain" (31). Nevertheless, people with SMI often exhibit insecure attachment styles and face challenges in building trust with others and within themselves (32), which can lead to compromised social functioning

(33). To help patients with SMI experience a sense of community during their hospitalization, we decided that conducting very simple occupational activities in a group setting would be effective. The activities introduced in the OT program to facilitate group adaptation were a walk in the hospital garden and seasonal handicrafts. All the patients looked at the same scenery, felt the same wind, and created a work of art together. Collaborative creativity in small groups has been found to reduce barriers to group participation (34), facilitate connections through shared experiences (35), and cultivate a sense of belonging by affirming acceptance within a group of peers with similar experiences (36). Moreover, the structured duration of an OT program that facilitates group adaptation allows participants to build a commitment to the creative process and establish personal expectations for contributing to the project's completion. These aspects likely enhance patient readiness for social activities by nurturing self-esteem, setting positive expectations about their capabilities, and strengthening their attachment to both their individual endeavors and the community. Such outcomes could contribute to an enduring sense of community following the patients' return to everyday life after discharge.

Our analysis, employing the CART algorithm, revealed that the impact of participation in an OT program that facilitates group adaptation on post-discharge social activity engagement might vary according to social activity status at admission and marital history. Patients who were able to engage in social activities at admission were not affected by other factors, with 90.5% of patients engaging in social activities after discharge. This result supports Killaspy et al. (14), who showed that pre-admission activity status was associated with successful discharge of patients admitted to a mental health rehabilitation service unit. Talevi et al. (37) also identified factors associated with high social functioning in patients with SMI during hospitalization as not experiencing interpersonal violence, participating in services, and having a high social network index. Social activity status at admission in this study may be similar to the high social network index. Therefore, patients who were participating in social activities at admission in this study may have had higher social functioning and successfully engaged in social activities after discharge without influence from other factors. Among patients who did not participate in social activities at admission, we observed that those who had been previously married were more likely to engage in social activities if they had an SAP participation rate above 52.6%. In contrast, those who had never been married exhibited successful social activity engagement regardless of their participation rate. The link between marriage and mental illness has long been noted (38–40). People with mental illness who are married are more likely to be in poor marriages or to consider divorce (41, 42). In this study, patients who had been married included those who had been divorced. The experience of divorce in patients with SMI has been associated with a fragile attachment style (43) and decreased subjective quality of life (44). Additionally, in the Asia-Pacific region, which includes Japan, traditional and cultural family roles significantly influence access to and provision of care and rehabilitation (45). For this reason, we speculate that to become socially active after discharge, patients with a marital history needed to develop a sense of community by participating in an OT program that facilitated group adaptation more than those who had never been married. Family dynamics can either facilitate or impede recovery in people with SMI (46). Future rehabilitation efforts should balance family involvement with the preferences and needs of people with SMI to improve outcomes. Furthermore, to promote empowerment in patients with SMI and fragile attachment styles, the preliminary establishment of a good therapeutic relationship has been suggested (32). Therefore, to increase OT group participation rates among patients who are unable to participate in social activities at admission and had been married, therapists must first establish a good relationship with their patients and help patients with SMI perceive the therapist as safe.

There are some limitations in interpreting the results of this study. First, the OT programs included groups of heterogeneous and diverse individuals. However, multiple logistic regression analysis indicated that the diagnosis of psychiatric disorders did not affect social activity after discharge. This suggests the existence of important support items that are common across mental illnesses in reconnecting patients with SMI with society. These items may show different aspects for different focal purposes. A good example is the effects of cognitive behavioral therapy conducted with transdiagnostic groups, focused on emotional disorders (47–49). The establishment of purposeful, transdiagnostic group rehabilitation methods in acute psychiatric units for a variety of mental illnesses is significant in terms of healthcare cost reduction. Second, psychoeducation or psychotherapy provided during hospitalization was not considered in the present analysis. It is possible that psychoeducation and psychotherapy provided to individuals may have helped underlie or encourage group OT participation for patients with SMI. Further investigation into the effective sequence and combination of various therapies to support the individual's wishes is warranted. Third, the social activities identified as outcomes in this study may differ from the individuals' aimed ultimate recovery. As the journey of recovery from mental illness is an "individual and unique process" (5), it can be difficult to identify the end of the journey during an acute psychiatric unit admission. The results of this study provide suggestions for OT practices that can facilitate the patient's journey to recovery in an acute psychiatric unit. Finally, the sample size of this study may be insufficient to accommodate decision tree analysis, which is typically a data-mining method for big data. In addition, because this study was conducted at a single site, caution should be exercised in generalizing the results. Further increasing the research data by unifying real-world OT practices at multiple centers and identifying key factors that reconnect SMI patients with society is necessary to examine the methods of transdiagnostic group rehabilitation.

5 Conclusion

In this study, we examined the factors contributing to social activity participation 1 year after hospital discharge among patients who received OT during hospitalization at a university hospital providing acute care. The results indicate that encouraging greater participation in OT programs that facilitate group adaptation can improve patient readiness for social activities post-discharge. The findings of this study offer valuable insights into the development of psychiatric rehabilitation content in acute care university hospitals and care expected to be instrumental in assessing the effectiveness of adjunctive therapies.

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.

Ethics statement

The studies involving humans were approved by The Ethics Review Committee of Kyorin University School of Medicine (Approval number: R03-095). The studies were conducted in accordance with the local legislation and institutional requirements. The ethics committee/institutional review board waived the requirement of written informed consent for participation from the participants or the participants' legal guardians/next of kin because This study was conducted as a retrospective cohort observational study with access to medical records and information collection only. In accordance with national ethical guidelines, it is not necessary to obtain direct consent for such research. Therefore, an opt-out procedure was implemented by posting a notice including the purpose of this study and contact information for refusal on the website of the affiliated institution.

Author contributions

IN: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. TH: Conceptualization, Data curation, Methodology, Writing – review & editing. KT: Formal Analysis, Validation, Writing – review & editing. MH: Data curation, Writing – review & editing. MM: Writing – review & editing. YM: Writing – review & editing. TM: Writing – review & editing. TK: Writing – review & editing. YI: Writing – review & editing. MK: Writing – review & editing. YO: Writing – review & editing. TT: Writing – review & editing. KW: Supervision, Writing – review & editing. HS: Conceptualization, Formal Analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

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

Publisher's note

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Exploring the role of the Recovery College model as a transformative tool for recovery-oriented practice: perceived benefits and perspectives from health practitioners in Quebec, Canada

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Introduction: Mental health practitioners (MHPs), including occupational therapists (OTs), need support to adopt a truly recovery-oriented practice. Like other practitioners, if OTs often embrace the principles of recovery as a philosophical foundation for their practice, these principles may not always reflect in their attitudes, behaviors or in their interventions. While further research is needed to demonstrate the positive effects of recovery-oriented training programs on MHPs' attitudes and practice, there is a need to explore novel training programs. The Recovery College (RC) model is one of the interventions that are designed to facilitate these changes in practice, through co-production and co-delivery of recovery-focused courses curriculum. Although the perceived benefits and outcomes of RC courses are widely documented, very few studies focus specifically on what MHPs gain from them or on their global experience. The aim of this article is to describe the experience of MHPs learners in RC courses and the perceived benefits on their practice.

Methods: An exploratory descriptive qualitative study was conducted. Data were collected through semi-structured interviews and analyzed using Miles and Huberman's stepwise qualitative analysis method.

Results: Participants were 13 MHPs working in community organizations or healthcare institutions and who participated as learners in a RC, in the province of Quebec, Canada. Ten themes emerged from the qualitative analysis. Participants expressed their perspectives on the format of the courses, their initial expectations and their recommendations. They also identified the types of knowledge they shared during the courses. Participants reported changes in their practice, raised awareness on their clinical and personal issues, improved well-being and recovery. Group composition, interactions within the group, complementarity of the different types of knowledge, and pedagogical design and learning activities were identified as key ingredients of RC.

Conclusions: This study highlighted RCs' role in enriching MHPs clinically and personally. RC curriculum and courses drive changes in practice and attitudes towards service users. RCs may assist MHPs reflect on practice and improve their clinical reasoning. This study advances understanding of a promising, accessible training program for adopting a recovery-oriented practice amid a paradigm shift among MHPs and OTs.

KEYWORDS

Recovery College, recovery, training program, occupational therapy, continuing professional development

1 Introduction

Over the last two decades, mental health practitioners had to navigate through a paradigm shift in mental health, as evidenced by the policies and mental health action plans in many countries, such as Canada (1, 2), the United States of America (3), England (4), New Zealand (5, 6) and Australia (7). Traditionally, healthcare systems have focused on reducing and eliminating problems, deficits, and dysfunction. Healthcare systems embracing the recovery paradigm support individuals in rebuilding and redefining their lives, transcending residual symptoms of mental disorders (8, 9). Mental health practitioners (MHPs), including occupational therapists (OTs), must now integrate the values, principles, attitudes, and behaviors that are closely associated with the recovery paradigm.

Recovery-oriented practice is the application of a set of competencies that supports individuals to recognize and take responsibility for their own recovery and well-being, and to become empowered and self-determined in their own lives (10–12). A recovery-oriented practice integrates principles such as self-determination and individualized care, and emphasizes hope, social integration, community involvement, personal goal setting, and self-management (13). Recovery-oriented practice requires a redesign of the practitioner-service user relationship by sharing power equitably with service users, with the role of the mental health practitioner is to be "on tap not on top" (14).

The ongoing paradigm shift within the healthcare system remains in progress. In a recent report, the World Health Organization (15) outlined key actions for transforming healthcare systems. These include bolstering promotion and prevention efforts and establishing accessible, affordable, and high- quality health services rooted in local communities. To advance healthcare transformation, intersectoral actions are necessary at system, organizational, and individual levels (16–18). Within this context, Perkins and colleagues highlighted the crucial role of frontline workers in driving meaningful changes "from the bottom-up" (9).

Occupational therapists are well positioned to serve as primary catalysts for the advancement of recovery-oriented practice for several reasons. First, the philosophical foundations and core values of the profession are well aligned with those of the recovery paradigm (19–22). Second, OTs are expected to analyze all the factors that may explain what facilitates or impedes occupational and social participation, including exploring existing potential opportunities. They are trained to reduce environmental and societal barriers and to facilitate engagement in a repertoire of meaningful and desired occupations (21, 23). Lastly, OTs assist service users in restoring hope and a meaningful life, in (re-) building a positive identity, and in reclaiming control over their life (21). Hence, OTs are already embracing some of the critical elements of recovery-based practice, although further work is needed in terms of advocating for system change (21).

2 Background

Many changes are needed to implement a true recovery-oriented practice. Some of these changes relate to the clinical processes and actions performed by MHPs (the what), while others are more subtle such as the manner, attitudes and rationale underlying interventions (how and why) (24–26). For example, within clinical processes, recovery-oriented assessments diverge from the traditional goal of identifying illness and planning treatment. Instead, they focus on developing and validating personal meaning, reinforcing strengths, promoting personal responsibility, supporting a positive identity, and cultivating hope (24). A systematic review indicates that MHPs commonly utilize assessment tools focused on limitations and impairments, thus constraining a strength-based perspective that emphasizes the individual's strengths and resources (27). This perpetuates a dichotomous perspective on health, where one is either healthy or ill, inconsistent with the recovery paradigm (28, 29).

Recovery-oriented practice is also influenced by the values, policies, and procedures of healthcare institutions, which may or may not be conducive to recovery. MHPs reported struggling to make sense of recovery-oriented practice due to competing priorities at different levels of the healthcare system (30). An increasing number of publications and initiatives on recovery-oriented practice actively involve occupational therapists, such as peer interventions (31, 32) and support for self-determination (33), suggesting their contribution in organizational transformation and paradigm shift (19, 21).

Some of the needed changes are more subtle and nuanced, such as the need for practitioners to introduce critical reflexivity on their own biases and assumptions. Unfortunately the presence of stigmatizing attitudes and behaviors amongst MHPs, known to have detrimental effects on therapeutic processes and health outcomes, is still frequently reported (34–36). In spite of explicit professional guidelines inviting OTs to advocate for service users and take actions against social and occupational injustices (10, 37), there is growing evidence that OTs are not immune to implicit biases and contribute at times to stigmatization, such as ableism, ageism, or racism (38, 39). This type of stigmatization may arise involuntarily and below the level of conscious awareness (40). Developing the professional competency to recognize this form of stigmatization within oneself is essential for minimizing personal bias and inequitable behavior rooted in social position and power (37).

Recovery-oriented training programs remain a key approach to developing recovery-oriented practice within the healthcare system (41, 42). To the best of the author's knowledge, there is no operational definition of what a recovery-oriented training program is, and what is identified as a recovery-oriented training program varies widely in subject matter, format, length, design, and provider (43, 44). Perkins and colleagues (9) advocate for recovery-oriented training programs that include the following features: (a) content that goes beyond recovery principles and addresses recovery-oriented interventions; (b) teaching methods that involve exploring and utilizing learners' ideas, competencies, and experiences; and (c) learner's groups composed of individuals with diverse expertise and backgrounds/professions.

The effectiveness of recovery-oriented training programs in fostering changes in knowledge, attitudes, and interventions among MHPs need to be supported by further evidence. Two literature reviews (43, 44) suggest that while these programs have shown a moderate impact on practitioners' knowledge and attitudes (excluding stigmatizing attitudes), they do not significantly influence practices. However, caution is advised in drawing definitive conclusions due to significant methodological heterogeneity among the studies included in these reviews, which varied in training formats, assessment methods, and study designs. Moreover, it is noted that the recovery-oriented training programs evaluated in these reviews do not align with all the features identified by Perkins and colleagues (9).

Recovery Colleges (RCs) emerged as promising entities for transforming the healthcare system that embody the values and principles of the recovery paradigm across their governance and courses curriculum (45–48). They are at the intersection of health promotion approaches, including primary, secondary, and tertiary prevention, and personal recovery (48). RCs are learning centers directly accessible to anyone interested in mental health and recovery, including those with experiential knowledge gained through life experience with mental health as a service user or relative, clinical knowledge gained and applied in the field as a mental health practitioner, and theoretical knowledge gained through academic, college, or university training in mental health.

The RC model is characterized by: (a) the creation of a co-learning space that recognizes the differences and value of each individual; (b) the sharing and recognition of different forms of knowledge; (c) the cross-fertilization of knowledge; (d) the mixing and hybridization of learners from different backgrounds (48–51). There is a correspondence between these characteristics and those that should shape a recovery-oriented training program as defined by Perkins and colleagues (9).

The current status of RCs worldwide shows that these centers are present in 28 countries across 5 continents (52). Many RCs reported the engagement of health practitioners in co-producing and co-facilitating courses (53). Hayes and colleagues (54) found that among the 59 RC surveyed, OTs were the most prevalent category of practitioners involved in the coproduction and cofacilitation of RC courses (41% of reported involvement).

In the last decade, approximately eighty studies (including 59 with evaluation data) have documented the key and active ingredients, implementation experiences, cost-effectiveness, outcomes and perceived benefits of RC courses (55, 56). For MHPs, attending a RC offers a valuable opportunity for reflective practice and some continuing professional development activities at a lower cost (57). While the outcomes and perceived benefits of RCs are increasingly documented, few studies specifically investigate what MHPs gain from participating in a RC as learners (58, 59). According to Perkins and colleagues (60), evidence regarding MHPs as learners is anecdotal. To our knowledge, no study specifically focuses on this category of learners who attend a RC, which will now be identified as mental health practitioners learners (MPHs learners).

The aim of this article is to describe the experience of MHPs learners, including OTs, in RC courses and the perceived benefits on their practice.

The three research questions are:

1. How do MHPs describe their experience as learners in RC courses?
2. What are the perceived benefits of the RC courses on their practice?
3. Based on their experience, what do MHPs learners identify as key and active ingredients of the RC model?

3 Methods

3.1 Design

An exploratory descriptive qualitative design was utilized due to the limited existing research on the perceived benefits of RC courses on MHPs learners. This design is valuable for understanding a phenomenon from the participant's perspective (61, 62).

This study is part of a larger evaluative research project funded by the Canadian Institutes of Health Research aimed at documenting outcomes and perceived benefits of RC courses among different categories of learners (63–65). This study addresses the questions posed by the larger evaluative research project but focuses specifically on MHPs learners.

3.2 Study setting

The study was conducted at the Health and Recovery Learning Center-Centre d'Apprentissage Santé et Rétablissement (CASR), the RC of the province of Quebec, Canada.

Established by an OT professor and researcher in 2019, the CASR is the only French-language RC in Canada. In the fall of 2020, in response to the Covid-19 pandemic, CASR adapted all its courses to online short-format in order to quickly reach as many people as possible. At the time of data collection for this study, the CASR provided only an RC curriculum and online courses for the French-speaking population of the province of Quebec (three sessions of two hours each, totaling six hours). Currently, it has expanded its offerings to include face-to-face courses in French and online courses in Italian.

CASR governance is multi-partner and multi-sectoral (including health, education, community, civic, and research), meaning that roles and responsibilities are shared between several partners from different sectors. Partner organizations are invited to submit ideas for topics of relevance to their members, in order to contribute to CASR's courses offerings. Several topics were covered, such as youth mental health, recovery, mental disorders, well-being and mental health, social networks and support, workplace mental health, social inclusion and living better together. Many OTs and OT students actively participate in CASR activities. They are founding members, trainers, partner organization members and learners.

The distinctive features of these courses encompass the following: (a) they are co-developed and co-delivered by a dyad of trainers (peer and practitioner trainers); (b) they employ innovative, participative, and active pedagogical methods; (c) they foster the hybridization and cross-pollination of theoretical, clinical and experiential knowledge. The courses are crafted as interactive workshops, incorporating a blend of reflection, discussion and co-production activities, experiential testimonials, and theoretical content.

3.3 Sampling and recruitment

The sampling and recruitment processes for this study were integrated into the data collection procedures for the larger evaluative research project. During the 2020-2021 academic year, all learners who have taken a course at CASR have been invited to take part in the research (n=379 learners). Participation in the larger project entailed completing questionnaires and sitting through an individual interview for 60 to 90 min. A total of 27 interviews were conducted between 2020 and 2021, with a diverse sample of learners (i.e.: university students, citizens, peer support workers, education professionals, health practitioners, health managers).

Out of these, eight interviews were retained as participants met the specified inclusion criteria for the current study. These criteria include: (a) being a mental health practitioner directly engaged with mental health service users or their relatives, or providing clinical support to other practitioners; (b) working in the healthcare sector (public, private, or community-based), and (c) having completed at least 2 out of 3 sessions of at least one course from the CASR.

Following the analysis of these eight initial interviews, and to ensure data saturation was reached (66), a new wave of recruitment was conducted during the academic years 2021-2022 and 2022-2023. This recruitment was pursued with learners who self-identified as health practitioners in the sociodemographic questionnaire of the larger evaluative research project (n=250). Ten MPHs learners expressed interest to be interviewed, and five of them met the inclusion criteria, resulting in a total of 13 interviews for this sub-study. Further details regarding the sampling and recruitment processes are illustrated in Figure 1.

3.4 Data collection

Four members of the research team conducted semi-structured interviews on videoconference platforms (Zoom and Microsoft Teams): two doctoral students, authors of this article (JB, AS), and two research professionals (JMM, MB). All interviewers are members of the research team. These research team members are under the supervision of the principal investigator. The principal investigator (CB) plays the role of liaison, keeping the CASR and partner organizations informed of the progress of the research project. Operations of the CASR, who hosts the RC, are overseen by CASR staff and partner organizations, at arm's length from research team.

All interviews were recorded on cloud-based video conferencing platforms, automatically transcribed, and then manually adjusted to rectify grammatical and content-related errors. Participants' names were anonymized and replaced by unique study identifiers to ensure confidentiality. The other members of the research team or the CASR never accessed the master list.

An interview guide was designed for the data collection of the larger evaluative research project which encompassed three thematic areas: (a) expectations, objectives, and experiences at the CASR; (b) understanding of the RC model and key and active ingredients (mechanisms of action); and (c) perceived benefits. For the purposes of this study, the interview guide was enriched by the addition of four questions specifically aimed at MHPs learners. These questions concern the perceived benefits in their clinical practice and their links with key and active ingredients (e.g., I would like to know what this type of learning has brought you. Can you give me some concrete examples related to your clinical practice?). Five additional questions were also added, focusing on various aspects of clinical practice: attitudes and behaviors, relationships with service users, choice of assessments and interventions, and development of professional competencies (e.g., Have you made any changes to your behavior and attitudes in your interactions with service users? If so, what specific changes have you made?).

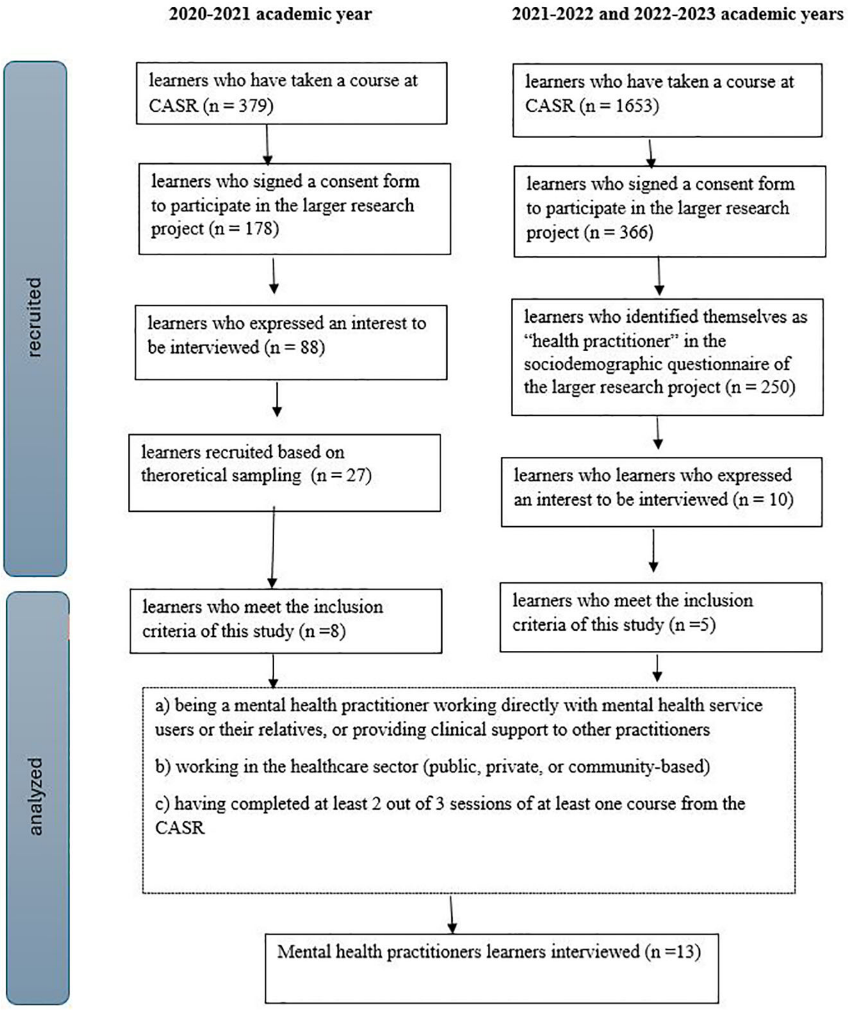

FIGURE 1
Flowchart of the sampling and recruitment of the study.

3.5 Data analysis

The data were analyzed with NVivo 14. The stepwise qualitative analysis method developed by Miles and Huberman (67) was used. The stepwise qualitative analysis method consists of three stages of activities: (a) coding data, (b) grouping into themes; and (c) validating themes.

A codebook with themes and definitions arising from the analysis was created through an iterative process by the first author of this article (JB). To ensure the rigor of data analysis, a 30% counter-coding of the interviews was conducted by the principal researcher of the larger evaluative research project (CB). To ensure consistency, intercoder reliability was calculated using the method proposed by Miles and Huberman (68) by dividing the number of agreements by the total sum of agreements and disagreements. These authors recommend a standard of 80% agreement on 95% of codes as a benchmark. The average inter-coder agreement between the two coders stood initially at 78%. Coding discrepancies were resolved through discussions between the two coders (JB, CB) until a consensus was reached. Subsequently, the lead coder (JB) adjusted the overall coding based on this consensus. Two research coordinators (LC, JNT) validated the codebook, encompassing definitions and quotes. This counter-analysis step ensured the exclusivity of themes and categories, accurate representation of quotes within definitions, and correct classification of each quote into its respective theme and category. This process allowed for final adjustments to be made.

3.6 Ethical considerations

The larger evaluative research project was approved by the research ethics committees of the Université du Québec à Trois-Rivières (#CER-20-270-07.01) and the Centre intégré universitaire de services sociaux et de santé de l'Est-de-l'Ile de Montréal (#MP-12-2021-2421). Each MPHs learners signed an informed consent document, after an information session, before entering the study. This informed consent was validated again at the start of each interview. All the data was securely stored on servers accessible exclusively to members of the research team.

4 Results

The study results will be divided into four sections. The first one will detail the sample, while the following ones describe the results associated with each research questions.

4.1 Sample description

Thirteen participants took part in the study. The majority were women (n=10), with an average age of 43 years, ranging from 28 to 53. The highest level of education varied from college to doctoral degree, with the majority of participants having a master's degree (n=7). The participants reported holding at least two types of knowledge (theoretical and clinical knowledge). Six participants also reported having experiential knowledge. Six different job titles were listed by participants, psychosocial practitioners (n=3) and OTs being the most common (n=3). Most of the participants worked in healthcare institutions (n=10), while three of them were employed in community organizations. Participants' profiles are described in Table 1.

To ensure transparency, the number of participants (n) is specified for each element emerging from the qualitative data analysis. All quotes have been translated freely from French to English. Figure 2 offers visual synthesis of the themes associated with each of the three research questions.

4.2 Experience of MHPs learners in RC courses

In this section the experience of MHPs learners in RC courses will be described, according to three themes: (1) The format of the RC courses; (2) Types of knowledge shared; and (3) Expectations and recommendations.

4.2.1 Format of the RC courses

All participants shared their perspectives on the format of the RC courses. Most participants expressed that there was added value in offering courses in an online format (n=11). Some participants valued this format because it was user-friendly and accessible, and reported on the dynamism of trainers, as demonstrated in the following quotes:

> *I will underline the trainers' dynamism, particularly on Zoom, where it is more challenging, as it can easily become monotonous. It seems they adeptly captured attention, benefiting from diverse facilitation techniques. Participant 9*
> *The fact that it's virtual, you know, makes it accessible. I don't know if I would have … Would I have gone to Quebec for a full-day course? I don't know, but having it virtually still allows us to … Participant 3*

Ten participants described the format of the courses as exchange-focused. These exchanges were characterized as warm,

TABLE 1 Description of the participant sample.

Participant	Gender	Age (years)	Highest Level of Education	Mental Health Knowledge[1]	Job Title	Workplace
Participant 1	F	41	master's degree	clinical, theoretical, experiential	psychosocial practitioner	community organization
Participant 2	F	43	bachelor's degree	clinical, theoretical	social worker	healthcare institution
Participant 3	F	35	college	clinical, theoretical	psychosocial practitioner	community organization
Participant 4	F	47	master's degree	clinical, theoretical, experiential	occupational therapist	healthcare institution
Participant 5	F	48	master's degree	clinical, theoretical, experiential	nurse	healthcare institution
Participant 6	F	51	master's degree	clinical, theoretical, experiential	psychoeducator	healthcare institution
Participant 7	M	47	bachelor's degree	clinical, theoretical	social worker	healthcare institution
Participant 8	M	35	master's degree	clinical, theoretical, experiential	psychosocial practitioner	healthcare institution
Participant 9	F	47	bachelor's degree	clinical, theoretical	psychoeducator	healthcare institution
Participant 10	F	34	master's degree	clinical, theoretical	occupational therapist	healthcare institution
Participant 11	F	53	doctoral's degree	clinical, theoretical, experiential	psychologist	healthcare institution
Participant 12	F	50	bachelor's degree	clinical, theoretical	occupational therapist	healthcare institution
Participant 13	M	28	master's degree	clinical, theoretical	psychosocial practitioner	community organization

[1] More than one type of mental health knowledge is possible per participant.

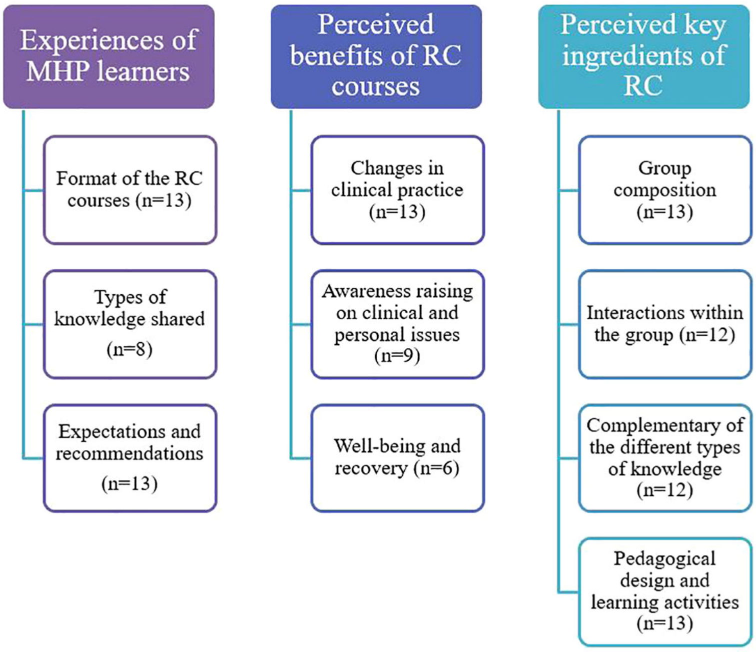

FIGURE 2
Synthesis of the themes associated with each of the three research questions.

friendly or relaxed. The atmosphere was marked by active listening and gentleness. Clear emphasis was placed on the interactions between learners and trainers throughout the courses.

> *It was really interactive, I think it's truly something that doesn't already exist. It's a good interactive element, in the sense of the things that we did and thought about together. Participant 13*

Seven participants insisted on the distinct format of the RC courses compared to other recovery-oriented training programs. The course was described as novel, original, and surprising: the group composition and the coexistence of all types of knowledge within the group was often associated with this idea of novelty.

> *And the fact that there were students, people with a mental health disorder, and practitioners from various fields […], I wasn't expecting that. My supervisor didn't tell me about it. I thought it was a course for mental health practitioners. I was pleasantly surprised by this kind of change. Participant 11*

Five participants mentioned that the RC courses featured a straightforward format with short-term, achievable objectives. They noted that courses demanded a brief commitment and supported the attainment of goals.

> *I would say it's also an achievable course (laughs), in the sense that I can commit to it three times. And achievable in the sense that I also achieve something, like at the end of the course or during the course. It's not just about medications or like … putting your whole life in order. It's up to me to want to recover and then see that it's possible, and that I can achieve it step by step, slowly, not all at once. Participant 1*

4.2.2 Types of knowledge shared

Eight participants shared their experience by describing the types of knowledge they shared with others learners and trainers in the courses. Two major trends were observed: (1) Participants who were emphasizing clinical knowledge; and (2) Participants who were navigating through different types of knowledge.

Five participants endorsed a perspective where clinical knowledge was emphasized, manifested through their contributions to the group, their attitudes, their choice of words, or their interactions with other learners, as exemplified in this quote:

> *When we were with service users or individuals who were not practitioners but rather peer support workers, it really brought another dimension. I think I quickly fell back into my role as a practitioner. I questioned the person, validated them a lot, and paraphrased. Participant 10*

Other participants (n=3) seemed to navigate from one type of knowledge to another. They reported adapting their discourses and the type of knowledge they wanted to put forward, depending on the nature of interactions, while focusing on the person-first, without considering titles and positions.

> *I went there, I moved in the three spheres, taking the position of a lambda person […], I didn't position myself, I never mentioned what my job title was, or where I worked. Participant 7*

4.2.3 Expectations and recommendations from the RC courses experience

All participants shared their initial expectations and some recommendations derived from their experience of the RC courses. Two major elements were identified: (1) Acquiring knowledge and tools for clinical practice; and (2) Enhancing the courses with a deeper integration of theoretical knowledge.

Participants mentioned some of their initial expectations, focusing on the acquisition of knowledge and tools that they could readily apply in their practice (n = 12). Among them, two participants particularly emphasized how they needed or wanted to gain tools that could help them in managing their own mental health. Some expressed that the tools that they could use in their clinical practice could also confer benefits at a personal level.

> *My main objectives were to better understand the recovery process and its underlying principles. I also wanted to assess if I could integrate this into my current practice, and how to introduce it to my colleagues and the physicians I work with. It's not a term commonly heard in my field. Participant 10*

Seven participants provided constructive feedback to improve the RC courses, suggesting a more prominent and comprehensive integration of theoretical knowledge. They described the theoretical foundations of the courses as basic; merely an overview, a refresher course, or a presentation of general definitions rather than a course that could advance the development of this type of knowledge. These participants were left unsatisfied.

> *Coming from my clinical perspective, I have a thirst for knowledge, you know. So I would have liked to acquire more knowledge. I definitely felt unsatisfied. Participant 3*

4.3 Perceived benefits of the RC courses

This section will focus on the perceived benefits of the RC courses. Participants identified both clinical and personal benefits associated with their participation in a RC, indicating a connection between the two levels. These perceived benefits will be presented according to three themes: (1) Changes in clinical practice; (2) Awareness raising on clinical and personal issues; (3) Well-being and recovery.

4.3.1 Changes in clinical practice

All participants reported changes in their clinical practice, following their experience in a RC course.

Ten participants mentioned that the course offered resources, information or tools on mental health, that could be applied or useful in practice, such as bibliographic references, visuals that represent the process of personal recovery, websites, and theoretical models. The participants reported that they could use these in their interactions with service users, their relatives or even with their colleagues in the workplace.

> *The positive aspect has been the contribution it brought. Well, I would say it's more related to knowledge directly linked to the subject. There are things that stood out to me, it helps me better understand resilience processes, truly work with it. You know, I've picked out bits that I've had said, 'I have to share this with the relatives of service users I meet in my practice'. Participant 3*

Ten participants described how the courses had enhanced their understanding of the needs of service users and their relatives and challenges they faced. For them, the courses brought a deeper understanding of the lives of service users, an openness to different perspectives, and allowed to put words on the realities, experiences and feelings associated with living with a mental disorder.

> *I can still imagine it, but when a mother comes to explain how she experiences it, and you know, not just one mother but two … And with two children who don't experience it the same way … It helps me better understand the person, support them more effectively, and understand their needs as well. Participant 9*

Seven participants explained that the courses modified their assumptions, their perceptions and their biases regarding service users. In that sense, their experience in the RC allowed to build a renewed perception of what is their recovery or the journey toward recovery. This was facilitated by the exchanges between trainers and learners, which were filled with hope and inspiration.

> *In the course of experiencing a particular situation or similar situations repeatedly, we are all susceptible to become disillusioned … There are clichés that we hear, like well, such and such person, we know psychosocial practitioner, will never get better, always messes up … As a psychosocial practitioner, our personal bias, at a certain point, leads you to try things with your client and sometimes, well, it feels like it's going nowhere. I believe it can bring about a change in our perceptions fundamentally, so necessarily, we will also act in a different manner. Participant 1*

Seven participants indicated that the courses facilitated the integration of experiential knowledge, whether from their own experience or from the one of service users. For two participants who had experiential knowledge, the course allowed them to confirm that they were not ready to share personal experiences in practice. Participants described that they integrated more experiential knowledge into their clinical practice by allocating of more time for service users to express themselves, either individually or in group settings.

> *I was facilitating a group [that the participant was leading at his workplace]. So it led me to reconsider things in a different way when it comes to group facilitation. The clinical impacts were precisely about taking the time, allowing people to speak, there was always this little reminder telling me, don't forget this, it's important. Participant 7*

Finally, seven participants explained that the courses enabled them to integrate recovery-oriented interventions more extensively into their clinical practice, such as promoting self-determination, encouraging peer support, adopting a strengths-based approach, or a systemic approach.

> *I think that I am less … Well, I was going to say less prescriptive. For sure, I still need to be, but still a bit less. You know, as I was saying earlier, regarding medication. I think I am more nuanced, less … More into empowerment but also in explaining the reasons behind my recommendations. Participant 9*

4.3.2 Awareness raising on professional and personal issues

Nine participants reported that the courses provoked clinical and personal reflections and raised awareness. Participants used verbs such as "reinforce," "raise awareness," "confirm," and "remind" to describe the perceived benefits of the RC courses on this theme.

Nine participants indicated that their participation in RC reminded them of the importance of maintaining a humble attitude and adopting an egalitarian stance when interacting with service users.

> *It prompted me to step back and gain perspective. We often emphasize that the service user is at the center of our practice in occupational therapy; the service user is at the center of our practice. However, it truly brought a sense of humility, encouraging me to reflect and consider the theoretical clinical knowledge versus experiential knowledge. Participant 10*

Seven participants shared that the courses raised their awareness of the universality of the experience of mental disorder: no one is immune from living them at some point in life. It is important to remain vigilant about one's mental health, and the one's relatives. To a certain extent, mental disorders are part of a normal life.

> *On a personal level, it helped me to further normalize stress. Stress as a mental health practitioner can still be relatively taboo. Saying 'I want to help 20, 30, 40 people a week, but I can't manage my own stress myself ', is somewhat confronting. Sometimes, just talking about it, normalizing that everyone experiences it, reminds you that just because you have a specific job, you're not immune to mental health disorder, stress, or depression. Participant 8*

Four participants indicated that the RC encouraged reflexivity on previous clinical situations encountered.

> *Continuing education should encompass experiential elements; it should include a variety of perspectives, different ways of seeing things. This allows individuals, through introspection, to question themselves, ponder whether they are doing things well, and understand why someone else might approach things differently. It's something we won't have if we only focus on theories without incorporating our own ways of doing things, without adding our life experiences. Participant 8*

For some participants (n=2), this reflection focused mainly on the role of change agent and a desire to mobilize to have a positive impact on the delivery of mental health services.

4.3.3 Well-being and recovery of participants

Six participants reported that their participation in the RC had an impact on their own well-being or their recovery journey. These participants explained that it allowed them to express themselves, to vent, and be truly themselves. They expressed that improving their own well-being enhanced their availability and their effectiveness in practice.

> *I brought out experiences that I think I had never talked to anyone about, and having this space to do it, yeah, it was quite nice. It felt good to share what I shared, and it felt good to be heard as well. To see that, well, there were others who had experienced similar or slightly different things. Participant 7*

Four participants also mentioned that the courses offered practical tools for maintaining their own mental well-being and seeking help when needed.

> *All the tools that were mentioned to express one's identity, activate one's body, mind, and senses, create connections with others, contribute to the community, to society. So, it's everything that I keep in mind, something I can refer to. I try to put this into*

> *practice in my own life, and I can also assist the service users with it. Participant 12*

Finally, three participants mentioned that the courses facilitated improved self-awareness about their interests, strengths, and goals. Some reported progress in their recovery journey.

> *I was listening to the trainer's talk, and he's like relaunching a career. It gave me the desire to be a nurse again, and to live with my limitations, and to accept my limitations. And to stop making society's limits my own. You have to listen to yourself, and that there's no failure, there's no failure in resigning from that system. Participant 5*

4.4 Perceived key ingredients of RC

This section will describe what the participants identified as key and active ingredients of a RC. Four main elements were brought up by participants: (1) The group composition; (2) The interactions within the group; (3) The complementarity of the different types of knowledge; and (4) The pedagogical design and learning activities.

4.4.1 Group composition

Most participants (n=13) observed the diversity of learners within the group. However, two participants noted an imbalance in their group, noting that there were many OT students and not enough learners with experiential knowledge. The similarities and differences observed primarily relate to the level of education, the diversity in the types of knowledge present, the and the job or workplace, the gender, and the age of learners.

> *There was diversity among us. Some were mental health practitioners, some had just finished their studies in the health domain, I think. And there were peer support workers. I think I was the only nurse. There was the unit leader, so there was a manager. Yeah, it was from all walks of life, all ages too. Participant 5*

Six participants also indicated that this diversity of learners enriched the course, adding sources of information, different perspectives or ways of thinking.

> *What I found truly enriching were the stories shared by individuals, offering diverse perspectives, —from a service user, a community organization, or within the healthcare system itself. You know, the health system, I hear about it, I know it more. Honestly, I believe the course would have been less interesting and less enriching if it had solely involved practitioners from healthcare institutions. Participant 9*

4.4.2 Interactions within the group

Most participants described the interactions between trainers and learners or among the group as a distinctive element of RC. Twelve of them noted that the relationships were marked by an egalitarian stance and inclusion, where no hierarchy was observed. Learners and trainers were also equal footing.

> *I didn't sense any condescending individuals; I didn't feel anyone discussing their experience with a certain superiority or judgment. I think it was truly egalitarian. Participant 8*

Eleven participants also mentioned the formation of varying degrees of interpersonal connection between learners throughout the sessions. These connections were described as a bond, a union, a sense of familiarity, or "shared insights" among learners. Collaborative work in sub-groups nurtured these connections.

> *A really nice bond was forming and persisted, even during the breaks. It remained very personalized, and there was like a little something special, a small bond that had been created during the sub-group, and that persisted. Participant 10*

4.4.3 Complementarity of the different types of knowledge

Twelve participants described the complementarity of different types of expertise and knowledge held by learners and trainers. They insisted on how the RC values the uniqueness, but also the differences amongst theoretical, clinical, and experiential knowledge, treating them equally. This fostered for participants a more nuanced and comprehensive perspective.

> *We are all different, we are all unique, we all have knowledge, we all have a background, and no matter where we come from, whoever we are, we all have something to gain from each other's experiences. There is no one better than the other, so I find it super interesting and rich to learn from everyone, actually. Participant 7*

Participants also mentioned the importance of experiential knowledge within the courses; nine participants described this being more authentic in RC than in other training programs. They indicated that experiential knowledge holds more meaning, evokes feelings and experiences, and enriches the courses.

> *There were a few people who had really experienced moments of depression or diagnosed anxiety. So, it put a bit of words, feelings on how one feels when in that situation, experiencing that. I found it interesting to have, to put emotions, to put a perception of how the person feels, what worked, what didn't work? I found it to be incredibly enriching, to be able to, not to put oneself in the shoes of, but to understand a perspective that is sometimes difficult to understand. Participant 7*

4.4.4 Pedagogical design and learning activities

All participants identified features of the pedagogical design or the learning activities as a central element of a RC.

Most participants (n=13) cited the manifestation of many humanistic values that influenced the courses' climate, that were demonstrated by both trainers and learners. These values encompassed respect and courtesy, openness, non-judgment, collaboration, compassion, kindness, authenticity, acceptance, and empathy. Such a climate nurtured confidence among learners, making them feeling welcomed and free to speak up and to participate in the proposed learning activities.

> *Co-learning means openness, making room for mistakes, embracing compassion, maintaining an open mind, and acknowledging universality. I believe that everything is received with respect, whether it be theoretical knowledge or experiential knowledge. Participant 4*

Ten participants also indicated that they appreciated the pedagogical design of the RC. More specifically, the structure of the courses, which involves a variety of activities, made the time pass quickly. They acknowledged that this type of design requires from learners to adopt an active and collaborative role.

> *I would really describe it as a type of collaborative learning. It involves making sense from multiple perspectives, bringing them together, and successfully advancing the process of reflection and reasoning. I truly believe that there is a co-construction happening. Participant 10*

Finally, ten participants explained that course design promoted assimilation, retention, and application of knowledge. Sharing drawn from experiential knowledge have particularly contributed to the retention of learning. One participant emphasized the role of feelings arising from experiential knowledge in this knowledge transfer process.

> *If it's someone who is an expert explaining things, and when I say an expert, it's not just because they have theoretical knowledge but because they have the knowledge of having lived it and gone through it, well, that makes more sense because it's a testimony of life, an experiential testimony. Therefore, affective memory comes to aid cognitive memory. Participant 7*

5 Discussion

The aim of this article was to describe the experience of MHPs learners, including OTs, in RC courses and the perceived benefits on their clinical practice. Participants described the format of the courses as exchange-focused, distinct, and straightforward. Offering courses in an online format added value to the experience, including making it more accessible. The participants also confirmed that co-learning in RC courses takes place within relationships marked by diversity, equality, and complementary knowledge.

Participants noted some benefits in their practice, such as an improved understanding of the needs and challenges faced by service users and their relatives, resulting in shifts in their perceptions and biases. RC courses offer mental health resources, information or tools on mental health, that can be applied or used in practice. They also support the use of recovery-oriented interventions with service users and their relatives or colleagues in the workplace. This is promising, given the limited evidence on the effectiveness of other recovery-oriented training programs on practice, such as the online webinar developed by the Substance Abuse and Mental Health Services Administration for acute care settings (69).

These findings align with previous RC studies. Participants recognized the distinct format and key and active ingredients of RC courses (70–73). They, like other learners, have acquired new tools beneficial for both professional and personal levels (59, 74). RC courses enhance understanding, empathy, and hope towards service users and facilitate the adoption of recovery-oriented interventions (58, 59). The findings support previous research indicating that RC courses underscore the importance of power equality within therapeutic relationships, promoting increased parity (58, 59, 74, 75). Interactions among diverse learners and trainers during RC courses fostered awareness of the universality and normalization of mental disorders (76).

These results also suggest that RC courses may contribute to the clinical reasoning of MHPs. According to OT literature, clinical reasoning refers to the cognitive processes practitioners employ during the planning, execution, and evaluation of their practice (77–80). Various types of reasoning have identified, including procedural, interactive, conditional, narrative, abject, pragmatic, generalization, scientific, ethical, and diagnostic reasoning (79–81). Interactive reasoning involves understanding the services users as individuals, including their perceptions of the events that prompted them to receive health services (77–80). Participation in RC courses enhanced participants' comprehension of the service users' needs and challenges. Procedural reasoning entails considering the disease or disability and selecting appropriate treatment activities (procedures) to improve the person's functional performance (78–80). Following the completion of the RC courses, participants reported the adoption of a range of recovery-oriented interventions. These included the promotion of self-determination, the encouragement of peer support, and the implementation of strengths-based and systemic approaches. Finally, MHPs use narratives (storytelling and story making) to convey and discuss therapy events and activities with services users (77–80). Recovery narratives can facilitate a dialogue between MHPs and service users (82, 83). RC courses support the integration of experiential knowledge into clinical practice, encouraging expression through increased individual and group interaction.

The results of this study, along with the RC model literature, invite researchers and practitioners to reflect upon and to explore how RC courses can serve as a transformative tool within the healthcare systems. To understand what can contribute to this transformation, the educational approach used in RC courses seems to be relevant (71, 76). McGregor and colleagues (71) identified a connection between the theory of situated learning (84) and the elements of active learning, co-construction, and "making meaning" together experienced in RC courses. This observation resonates with Illeris' theory of transformative learning (85, 86), encompassing cognitive, emotional, and social dimensions, and its relevance to RC educational approaches. The active engagement of learners and trainers in a co-constructed and egalitarian learning process where theory (cognitive aspect), experiential narratives (emotional aspect) and exchanges (social aspect) enable the creation of an integrated understanding of the issues, which may explain what makes the RC educational approach effective (48). Participants reported that experiential narratives facilitated the assimilation, retention, and application of knowledge. They learned in a different way than they were used to in other training courses. This may be one of the ingredients that enabled the adoption of recovery-oriented practice, along with other well-established ones such as organizational commitment (16, 42–44, 87).

For OTs, the RC model offers a pathway to move from a recovery philosophy to a recovery-oriented practice, benefiting both themselves and the service users and relatives they support. Through the use of this model, OTs may have the opportunity to foster collective intelligence aimed at effectively addressing mental health needs within communities. This transformative potential suggests that OTs could play a significant role in advancing recovery-oriented practice.

5.1 Study limitations and future perspectives

In spite of the use of a purposive sampling strategy to recruit participants, this research took place in a specific cultural context, which may affect the transferability of the results. It will be important to continue evaluating the experience and perceived benefits of MHPs, moving towards more scientific robust designs. Another limitation of the study is the lack of an objective description of the use of recovery-oriented interventions by MHPs before and after participation in RC courses. Therefore, a self-assessment tool for MHPs focusing on recovery-oriented competences and interventions is currently under development (88). We also noted that several participants of our study reported already having a recovery-oriented practice, with RC courses serving to confirm or remind them of the importance of certain attitudes, behaviors, and interventions aligning with the recovery paradigm. This highlights the need to objectively differentiate the level of "expertise" in future participant samples. For example, a study could be conducted with OT students, novice OTs, and senior OTs to examine whether the perceived benefits of RC courses differ according to clinical experience and their exposure to recovery-oriented practice.

6 Conclusion

This study highlighted RCs' role in enriching MHPs professionally and personally. RC curriculum and courses drive changes in practice regarding mental health resources, attitudes towards service users, understanding of their challenges, and interventions. By fostering an inclusive learning environment valuing diverse knowledge, RCs help MHPs reflect on practice and improve clinical reasoning. This study advances understanding of a promising, accessible training program for adopting a recovery-oriented practice amid a paradigm shift among MHPs and OTs.

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.

Ethics statement

The studies involving humans were approved by research ethics committees of the Université du Québec à Trois-Rivières (#CER-20-270-07.01) and the Centre intégré universitaire de services sociaux et de santé de l'Est-de-l'Ile de Montréal (#MP-12-2021-2421). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

JB: Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. AS: Formal analysis, Writing – review & editing. MD: Funding acquisition, Writing – review & editing. CV: Funding acquisition, Writing – review & editing. CB: Conceptualization, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing.

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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.

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Mental health challenges of recent immigrants in precarious work environments — a qualitative study

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Introduction: Recent immigrants from racialized minority backgrounds and those who are not proficient in the local language are some of the most vulnerable members of society. Despite having postsecondary educational qualifications and permanent residency status, many are engaged in precarious employment. There is a scarcity of research that has explicitly focused on the work experiences and mental health challenges faced by these immigrants.

Methods: Using a grounded theory approach and semi-structured face-to-face interviews, this study examined the work experiences and mental health challenges of 42 recent immigrant employees from two cities in Canada who were working in various industries and engaged in precarious employment.

Findings: Eighty-one percent of the employee participants were overqualified for their jobs. Findings highlighted several ongoing mental problems that participants experienced, stemming from challenging physical and psychological workplace conditions, negative mindsets associated with their recent immigrant status, and other contextual factors and barriers. However, various coping strategies, both constructive and unconstructive, were used to address this mental distress.

Discussion: The study proposes a multidimensional approach to address workplace conditions to promote good mental health for these employees. This includes preventative programs for raising awareness among employers about the importance of recent immigrant employees' mental health and well-being and policy and legislation changes to ensure the employer's commitment to creating a safe and culturally friendly workplace. The approach also recommends that recent immigrant employees receive occupational health and safety training, learn about Canadian workplace norms and culture, and have access to professional healthcare services.

KEYWORDS

recent immigrants, precarious employment, mental health, well-being, overqualified

1 Introduction

Many immigrants, driven by the need to enhance their quality of life, safety, and social mobility, uproot themselves and their families to move to a new place. Though not without challenges, their journey is a testament to their resilience and determination (1). For most immigrants, meaningful and gainful employment is critical for their adaptation, integration, and physical and mental health. However, despite having post-secondary qualifications or professional/trade expertise from their home country, many recent immigrants (those in the host country for less than ten years (2) often find themselves in precarious employment (PE) conditions below their educational levels, skills, and experience.

1.1 The pervasive nature of precarious employment

There is no universally accepted definition of PE (3). Still, a systematic review of definitions and operationalizations from quantitative and qualitative studies highlights that PE is a multidimensional construct that includes three dimensions: (a) job insecurity, (b) income inadequacy, and (c) lack of employee rights and protection. The last dimension refers to the lack of unionization among employees, lack of social benefits like employer-funded pension, medical benefits, or leave, and lack of workplace rights like protection against unfair dismissal, protection from authoritarian treatment, discrimination, or harassment (3–5). Some conceptualizations of PE also include poor workplace social support, lack of access to training and development, low work status, and high exposure to occupational health hazards (6). PE has been increasing globally since the 1980s and has been attributed to factors such as the weakening of labor unions, the digitalization of the workforce, the rise of the discourse of individualism and personal responsibility, and the takeover of the economy by financial sectors and elites who influence economic policy and outcomes (4). These structural shifts have emboldened employers to relax employment standards and increase the number of low-paid contractual workers with poor access to collective representation (4). Although precarious employment has always been most prevalent among immigrants, racialized groups, and women, it is now found in all income levels and demographic groups in current employment systems. PE encompasses many jobs ranging from semi-skilled ones requiring only on-the-job training to skilled work that requires high qualifications (7). According to Statistics Canada, 2018 (8), over 30% of Canadians in Canada work under temporary, seasonal, or contract employment. Research shows PE can adversely affect employees' health and well-being (3, 7). The risks associated with PE include musculoskeletal and cardiovascular diseases (9, 10) and mental health conditions like stress and anxiety, depression, sleep disturbances, and burnout (11, 12).

1.2 Immigrants and precarious employment

Several international studies show a high prevalence of mental disorders such as depression, anxiety, and substance abuse among immigrant employees. These issues are attributed to precarious employment, workplace psychological stressors, poor working conditions, and abuse, as well as various personal, social, and environmental factors (13, 14). The International Labor Organization (ILO)reports that there are approximately 164 million immigrant employees across the globe, and about two-thirds of them live in high-income countries like Canada, Australia, and the United States, where they are an essential labor resource performing semiskilled jobs (15). These immigrants comprise the host country's permanent residents (PR), temporary foreign workers (TFWs), international students with work permits, and undocumented immigrants without legal immigration status and work permits. In Canada, PR status grants the individual the right to live and work permanently in Canada, study, and access most social benefits, including healthcare and social services, similar to Canadian citizens. TFWs and international students are bound by specific conditions (8, 16), such as the length of their stay in Canada and the nature of work or study they undertake, and have restrictions on accessing certain social benefits. However, TFWs have the same rights and protections as PRs and are eligible for provincial/territorial health care plans. While selecting newcomers for permanent resident status, countries like Australia and Canada attract relatively young, professionally qualified, and skilled immigrants with language proficiency, job offers, or in-demand skills (17). Yet, when these newcomers land in the host country, many get funneled into precarious labor market conditions and undertake jobs for which they are overqualified (18). This experience can affect many skilled immigrants' physical and mental health (19). The critical reasons for their loss of professional status include a lack of recognition of foreign credentials, delayed assessment by provincial regulatory bodies, and a lack of Canadian employment experience (20). While some move into better jobs over time, many qualified immigrants continue in such employment for extended periods (20). Additionally, language and communication barriers, lack of social support and professional networks, and poor understanding of health care and labor laws expose many of these individuals to employer prejudice, racism, harassment, and exploitation (21, 22). Immigrant employees who do not have PR status may experience additional challenges, like being asked to perform jobs that are not in their contracts under threat of deportation (22). These challenges are exacerbated by failures in employment laws and regulations and other social and cultural issues related to absorbing new immigrants. For instance, employment laws may not provide adequate protection for immigrant workers, and due to sociocultural barriers such as discrimination, they are left vulnerable to exploitation. All these factors increase the risk of immigrant employees developing mental health problems (22).

Although precarious employment can adversely affect the health of all employees, its health effects on the general population can differ from those on immigrants, who can vary from non-immigrants in their health status, expression of health problems, access to healthcare services, and health-related risk factors (23, 24). Hence, there is a need for research that focuses explicitly on examining how precarious employment conditions impact the mental health and well-being of immigrant groups, like recent immigrants who are permanent residents and temporary foreign workers (TFWs) (24).

Several quantitative studies (25–27) have shown a positive causal association between precarious employment and poor mental health, but the mechanisms that explain this relationship have not been sufficiently examined in research (28–30). Qualitative research that focuses on employees' lived experiences can help in understanding how and why precarious employment has negative implications for the mental health of immigrant employees and what coping strategies these individuals may use to manage their challenges.

Given these research gaps, the objective of the current study was to examine the work experiences and associated mental health challenges faced by recent immigrant employees in the context of precarious employment. This study specifically focused on recent immigrants with PR status for two reasons: first, there is relatively little research on the work experiences and mental health challenges faced by this population, and second, this group would seem to be potentially less vulnerable to exploitation by employers compared to TFWs and undocumented workers who do not have PR status. The findings can help countries that receive a high number of qualified, skilled immigrants, like Canada, understand the multifaceted challenges immigrant employees face due to the intersectionality of mental health, working conditions, and recent immigrant status.

1.3 Theoretical perspectives: understanding immigrant employees' experiences from an intersectionality perspective

Recently, some studies have used the intersectionality perspective as a lens to understand the experiences and needs of immigrants in developed countries (31, 32). According to this perspective, multiple factors can shape subjective well-being (33), which refers to people's appraisal of various domains of their lives, like health, work, family, or feelings, which can be both positive and negative. Positive feelings may include pleasure, while negative emotions may include pain, worry, and anger (34). When applied to recent immigrant employees, the intersectionality perspective helps in understanding how being a member of multiple marginalized groups puts them at risk of being treated unequally, thus making them more vulnerable to negative experiences and exacerbating their mental health risks.

This study also draws on Smith and colleagues' occupational health and safety (OHS) vulnerability framework (35), which identifies four dimensions that raise employee risk of physical and psychological injury. These are poor awareness of OHS, workplace hazards exposure, poor workplace protections, and a workplace culture that discourages employees from asking questions about safety. This framework can also be applied to recent immigrants who may have limited OHS understanding and training, are likely to engage in precarious employment, and may feel they need more support to voice their safety concerns.

Although the current study draws from multiple perspectives and frameworks as a conceptual base, it does not adopt or test a specific theory or framework.

1.4 Research questions

The primary research question was: What are the work experiences of recent immigrant employees with permanent residency status engaged in precarious employment, and how did these contribute to their mental health and well-being? A secondary research question was: What strategies do recent immigrants use to manage their work-related challenges?

1.5 Ethical Statement

The current study is part of a larger study titled "Immigrant worker, service provider, and employer perspectives on the occupational safety and work conditions of immigrant workers, and their return-to-work experiences after occupational injury or illness." Before beginning the data collection for the study, ethical approval was obtained from the Research Ethics Board at the lead author's university. Each study participant was fully informed about the objectives and procedures of the study before their interview, the risks and benefits of participating, and that their participation was voluntary. All the participants provided written consent for their participation.

This study was conducted in Canada. Most studies on the labor market and work experiences of immigrants in Canada have been conducted in major Canadian cities like Toronto, Vancouver, and Montreal, which are traditionally the preferred destinations for newcomers (36). With a notable shift in the settlement patterns of newcomers to smaller urban centers in recent years (36), there is a need for research on the work experiences of newcomers in these centers with fewer resources. The current study addresses this need. The participants for this study were recruited from Edmonton and Calgary, the two largest cities in Alberta province with a high proportion of immigrants (37).

2 Materials and methods

2.1 Research design

Given the exploratory nature of this research, a constructivist grounded theory approach (38) was chosen to understand and explain recent immigrant employees' work experiences and their influence on the mental health and well-being of study participants. This approach positions the researcher as a co-author in the (re) construction, interpretation, and representation of knowledge, experiences, and meanings while retaining participants' own words and stories in written representations (38).

2.2 Conceptualizing mental health and well-being

This study conceptualizes mental health from a psychosocial instead of a clinical perspective. The participants were not asked specific Western medicalized questions about symptoms or diagnosis. Given the personal nature of all psychological experiences and ongoing debates about the utility of diagnostic measures (39) and in keeping with several qualitative studies that do not use standardized measures to assess mental health (40), this study's assessment of the participant's mental health and well-being was based on subjective accounts of their psychological states as elicited during the research interviews.

2.3 Study sample

A purposive sampling approach was used to recruit participants. To be eligible to take part in the study, the person had to be: (a) from backgrounds that are racialized and non-English speaking, (b) between 18 -60 years, (c) a permanent resident (PR) or Canadian citizen for < 10 years, (d) currently working or has gained Canadian work experience for at least two years as a PR and (e) working in a job that they perceived was unsafe and had a high chance of getting injured. Those excluded from this study were temporary foreign workers and undocumented laborers. Eligible participants were recruited with the help of service providers from immigrant-serving organizations who had advertised the study through their client networks. Some were recruited through the researchers' community networks.

2.4 Data collection

Recruitment and data collection started on August 2, 2017, and were completed on November 28, 2019. The lead investigator(JS) and two trained graduate research assistants (AA, ZS) conducted face-to-face and in-depth interviews using semi-structured interview schedules. Each interview lasted for 1.5 hours and was conducted to understand the participants' experience of job hazards, the conditions under which they worked, the physical and emotional challenges they experienced, and their awareness of the safety aspects of their jobs (refer to Appendix). Further probes, clarifications, and questions were developed in response to participants' answers. The research team developed the interview schedule in consultation with immigrant service providers. The interviews were held in the principal investigator's office or a location chosen by the participant. The interviews were conducted in English since participants reported adequate fluency. However, since many participants did not have enough vocabulary to narrate their experiences, the interviewers gave them enough time to complete what they wanted to convey and used simple sentences and examples to explain a question or concept. The interviewers also paraphrased statements to ensure they accurately captured what participants wanted to say. The interviews were audiotaped and transcribed verbatim after obtaining the participants' written consent. Each participant received an honorarium of $50 for their participation.

2.5 Data analysis

Data collection and analysis were done simultaneously. During the interviews, the interviewers made notes of meaningful discussions. During research team meetings, the group discussed biases arising from interviewers 'positionality and professional beliefs, theoretical orientation, immigration status, social positionality, coding decisions, interview notes, and their emotional responses toward participants.

The data analysis process was characterized by transparency and openness, beginning with loading verbatim transcriptions onto Atlas—ti 7 Software for initial coding and framework development. The grounded theory approach, with its emphasis on iterative data collection and analysis, constant comparison, theoretical sampling, and memo writing, ensured that our findings were deeply rooted in empirical data (38). To further ensure the study's trustworthiness, two research assistants (SJ, ZS) coded independently and then compared codes to ensure inter-coder reliability. The research team rigorously assessed internal validity, external validity, reliability, and objectivity based on credibility, transferability, dependability, and confirmability (41–43). The resulting codes were organized under broad thematic headings related to the study objectives. Despite achieving theoretical saturation (41, 42) after analyzing thirty transcripts, we chose to analyze all 42 interview transcripts. The entire research process and analysis procedures were meticulously documented, and hard copies of the transcripts were maintained.

3 Results

3.1 Demographic characteristics of study participants

Table 1: Demographic characteristics of participants.

This study included a diverse group of participants: 23 (55%) men and 19 (45%) women between 18 and 55 years old. The participants, who were either permanent residents or citizens, hailed from a variety of regions, including Asia (43%), Africa (26%), Eastern Europe (24%), and Central South America (7%). The sample included overseas qualified engineers, lawyers, business managers, health care professionals (doctors, social workers, nurses), and IT professionals. At the time of the interview, nine participants who had sustained injuries were not working. Although the recruitment process did not specifically target qualified recent immigrants, thirty-four (81%) of the participants had undergraduate (38%) or graduate degrees(38%) or specialized trades qualifications from overseas (24%). They were engaged in skilled work in their country of origin. Currently, they are doing jobs for which they are overqualified. An immigrant is considered

TABLE 1 Sociodemographic data of participants.

Attributes	Injured	Non Injured	Injured but did not report
Gender			
Men	12	10	1
Women	12	5	2
	(9 not working)		
Age			
18-25	1		
26-35	6	2	
36-45	8	5	2
46-55	9	8	1
Education			
High school	5	3	
Undergraduate degree	10	4	2
Master's degree	8	7	1
PhD/MD	1		
Overseas trade certificate		1	
Number of years in Canada			
1-2 years	3	4	
3-5 years	12	6	2
6-< 10 years	9	5	1
Region of Origin			
Asia	11	5	2
Africa	5	6	
Europe	8	1	1
Central South America		3 -	
Industry Employed			
Construction	5	2	1
Healthcare	2 (social worker)	2 (nurses)	
Hospitality	3	2	1
Manufacturing	2	1	
Retail	6	7	1
Oil and Gas	5	1	
IT/other		1 (IT)	

overqualified if the skill requirement of their current job in Canada is lower than their educational attainment and lower than the skill requirement of their job before they migrated to Canada or lower than the skill requirement of their job in Canada (44).

At the time of the interviews, they worked in retail (33%), construction (19%), the gas and oil sectors (14%), hospitality (14%, cooks, cleaners) and health care (10%). Others were in manufacturing (warehouse workers, shop and machine assistants) and information technology. Thus, a significant difference between this immigrant group of employees and other precarious workers is that almost two-thirds have done more skilled work before their migration and are qualified to do so. Except for the participants who worked in health care and the oil and gas industry, none had formal work contracts and were employed casually or temporarily. Only the nurses and social workers had successfully found work in their fields, though much below their experience level. All the participants perceived that their jobs were unsafe.

Twenty-four (57%) participants had sustained and reported a physical workplace injury/illness, and three participants failed to report their injuries. Fifteen participants (36%) were not injured or did not report any injury. The injuries sustained by the participants varied in intensity and severity. They included back, shoulder, and arm injuries, strain injuries, burns, and psychological injuries arising from experiences like bullying and harassment (experienced by ten), though these latter injuries were not reported.

3.2 Mental health issues faced by participants

Most of the participants identified several workplace conditions that created ongoing psychological distress. They described their distress in lay terms like stress, fear, sadness, worry, anger, anxiety, frustration, dissatisfaction/unhappiness, crying, blaming self, not good enough (self-doubt), lacking confidence, shame, embarrassment, inferiority, and guilt. They also reported headaches, frequent body aches and pains, sleep difficulties, and exhaustion. Only two participants used the terms depression and anxiety to describe their mental health condition.

Figure 1 provides a conceptual framework for the findings. It identifies the four key themes that influenced the participants' mental health. The first theme, challenging workplace conditions, highlights several workplace factors (sub-themes) that influenced the participants' mental health. The second theme identifies the mindsets participants developed because of their workplace experiences; the third theme highlights contextual factors related to their recent immigrant status that affected their mental health. The fourth theme, coping strategies, reveals various methods that the participants used to deal with the mental health challenges. The following sections are structured around each theme and highlight how their work conditions affected participants' health.

3.3 Challenging workplace conditions

3.3.1 Job characteristics

Several participants recounted working in adverse environmental conditions on a daily or regular basis and the toll these had on their physical and mental health. These conditions

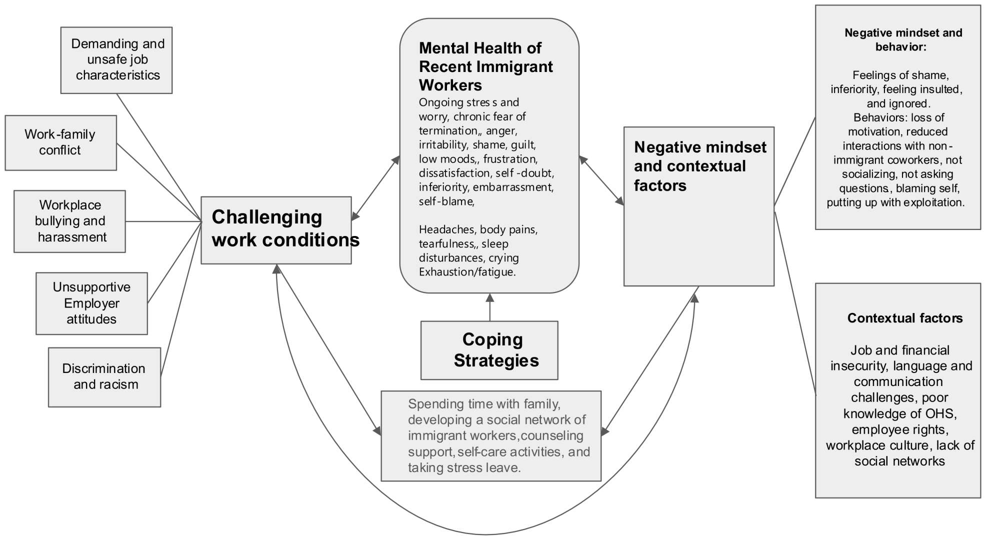

FIGURE 1
Pathways between mental health, precarious employment, and factors associated with recent immigrant status.

included exposure to toxic chemicals, working in confined spaces, working alone at night, and working outdoors in cold or inclement weather, often leading to accidents like slipping on ice. The impact of becoming physically unwell due to these exposures usually made them dislike going to work. Still, they reported that they could not quit because of the fear of not getting another job and financial insecurity.

> *Yes, my job is highly intense. I have to sit down all day. I feel pain in my shoulders and my neck. I have to keep one position repeatedly all day. Sometimes, fumes cause headaches because the smell is very strong. But what can we do? It is part of our job. (E)*

Participants also faced additional stress from the physical demands of the job, which included repetitive work, heavy lifting, and prolonged standing, which resulted in sprain injuries and body aches. Those who worked with dangerous machinery without adequate training and personal protective equipment (PPE) reported being constantly worried that their health may be affected at some point.

Some participants could deduce that their injuries resulted from a mismatch between their high educational qualifications and the jobs that they were currently doing. One of these participants, who had specialized in public health and had worked as a public health specialist back in his country and had no experience with physical labor jobs, shared his mental distress and physical agony because of a spinal disk injury he had sustained in Canada due the heavy lifting he had to do as part of his current job. He attributed his injury to a lack of training and experience in doing labor jobs. Similarly, an overseas qualified medical doctor who had sustained a severe arm injury while working in a low-skilled job in the hospitality industry linked her injury to a lack of experience in doing labor-intensive jobs and shared her grief of not being able to work anymore as a doctor because of being in constant pain.

Participants also shared sleep difficulties arising from working 12-hour shift rotations, making them tired, irritable, and anxious. In addition to the constant worry that she could "kill someone" if she made a mistake, a nurse participant reported feeling "very stressed" because her unit was understaffed. She said extremely busy nurses take shortcuts and sometimes do not follow safety protocols, which leads to injuries. Several participants noted that heavy workload and the pressure to work faster affected their sleep patterns and increased the risk of accidents. A woman participant shared that her blood pressure had shot up because of a heavy caseload and lack of sleep. Five women participants expressed that the physically demanding nature of their work during their pregnancy impacted their health. In one case, the physical and mental strain at work during her pregnancy caused her blood pressure to rise and induced premature labor.

3.3.2 Work-family conflict

At least ten participants spoke about not being informed in advance about their work schedule and asked to work extra hours on short notice. While some were angry for not being paid overtime, others were upset because they had to be constantly available, which created difficulties when planning for other areas of their lives, especially time with family. They reported that the fear of being replaced by other workers (job insecurity) was a significant factor that made them agree to always be available for their employer.

> *Sometimes, I have days off, and they call me. I am supposed to go somewhere with my family, and then they call me. 'We need you! We cannot have a job done unless we have people like you. You have the right to refuse, but when you refuse, your manager will*

> *not be happy. I sacrifice and I go to work and then my family would be angry! (AK)*

Women participants who were asked to do frequent evening shifts were very unhappy and often experienced guilt because the shifts came in the way of being available for their families, especially dependent children. A woman participant who frequently did evening shifts and had two jobs explained:

> *My son used to come back home after school around 4 pm but at that time I had to be in the workplace. I could not take care of my child, could not feed him, or could not stay with him. After coming home at 10 PM, I often found that my son was sleeping without eating his dinner. My son was also deprived of my care when I had to work very early in the morning. Sometimes, it happened that I could not see my son all day. (U)*

In addition, participants who were experiencing physical health problems and mental stress at work said that they could not share some of their issues with family members. One of them expressed:

> *When I am sick, the entire family is affected … After coming from work, I cannot say I feel pain in my leg. I need to cook food for my family, and I have to take care of my son. So, if I do so, it would create further mental stress for all of us … That's why I did not let my family know that I was suffering. (UZ)*

Work demands also affected participants' ability to make time for self-care. A participant who had been advised to see a medical specialist experienced difficulties making appointments because she worked on the days the specialist was available. While some participants expressed anger at being unable to achieve a work-life balance, others felt guilty because the lack of this balance affected their health and family life.

3.3.3 Workplace bullying and harassment

Ten participants reported experiencing harassment and bullying from their supervisors and coworkers. They said they were unaware these were occupational health and safety issues and could be reported. They also expressed worries about reprisal if they reported. In some cases, the perpetrators were immigrant supervisors and coworkers. A participant who had developed anxiety and sleeplessness and was taking antidepressants due to bullying and harassment by her team members who were from a different ethnic group described enduring several weeks of mental agony before she could muster the courage to inform her senior supervisor of her desire to quit.

At least 25% of the participants described their work environment as toxic, with minimal trust between immigrant and Canadian-born employees. One of them said that name calling (for example, 'curry for South Asian) is a common form of harassment. He reported that while some Canadian-born coworkers viewed using such names as playful teasing, many new immigrants experienced this as a form of harassment that they had to put up with to be perceived as good team members. Additionally, the majority of participants reported that many new immigrants find it difficult to report harassment due to language barriers and a lack of social connections.

> *Because we have language barriers, we do not know many people here; we do not know where to go if we have any problem in our workplace … We do not know how we should tell our problems to others. That's why we cannot tell our stories to others (coworkers and supervisors), and we try to refrain from complaining about others when they are very rude to us (CZ).*

3.3.4 Unsupportive employer attitudes

For most participants, their employers' attitudes towards them were the primary source of workplace stress. At least 50% of the participants said they felt financially and emotionally exploited by their employers/supervisors. Some employers did not pay overtime, while others did not provide adequate lunch breaks. A participant was told he could take breaks only when the "workplace was not busy," which rarely happened.

> *Usually, I work 40 hours per week. If I work more than 44 hours, I'm supposed to get overtime pay, but it never happens. I have never received any overtime pay from my company even when I work 50 hours per week because we have to catch up on the schedule. I don't want to lose my job. So, I just keep silent. (F).*

Many employers also set unrealistic expectations and targets that did not give participants a sense of control over their jobs and made them feel devalued. A participant who was employed as a team supervisor and had recently quit her job said:

> *I was asked to fulfill what felt like impossible targets. So, it was an environment where it was impossible to succeed. I wanted to be a good boss for my employees, and I felt I didn't know how to do that anymore. So, it definitely had a direct impact on my mental health and impacted my ability to sleep and have emotional regulation. It's just a very hostile and toxic space to be in. (B)*

In some workplaces, the benchmark for work performance was set high to match that of the fastest workers, inadvertently forcing all workers (and not just immigrant workers) into unhealthy competition. This unhealthy competition reinforced participants' beliefs that their employers valued productivity and profit more than their physical and mental safety. Participants who were caught in this situation and could not keep up with the pace of work feared they would make a mistake and be laid off.

Unsafe and poor working conditions added to the fear and anxiety participants experienced. Several participants expressed that their employers did not enforce safety compliance and escaped punishment because of government safety departments' lack of safety inspections. Worse still, refusing unsafe work was not an option for these participants. They knew of other immigrant workers who were fired for speaking up or refusing hazardous work. The constant threat of termination and financial insecurity led to further mental health decline, as illustrated by the following quote from a participant:

> *Employers, immigrant or Canadian, always keep immigrant workers under pressure. They know that these workers need a job to survive here, and they do not have that many options, like the Canadian-born people, to get another job. We do not know many people, we don't know many rules and regulations, so we do not dare to complain. We have to struggle in the workplace, and we have to bear many different types of stress and pain day after day because we need the job! (T)*

Compounding this stress, employers provided little or no information to injured participants on what post-injury support is available and how to access it. Their supervisors would often try to shrug off responsibility by blaming the participant for the injury, not advising them to put in a worker's compensation claim, not providing workplace accommodations after the injury, or not offering a gradual return-to-work plan commensurate with the worker's pace of recovery. Lacking support from their employers, many injured participants felt disenfranchised and had to learn how to navigate the complex worker's compensation system. For injured workers who were already under financial stress because of income reductions, their anxiety was further exacerbated as they were left wondering if there would be a job for them to return to.

3.3.5 Discrimination and racism

The majority who reported racism experienced this from white supervisors or coworkers, though a small number reported experiencing racism from immigrant supervisors and coworkers. Participants who had experienced racial discrimination from white supervisors reported feelings of anger and demotivation when they noticed that their white Canadian peers were treated more favorably, were held to a lower standard of accountability, and were not written up for being tardy or for missing work. One of these participants shared his experience.

> *We have these guys (coworkers), they are White. When they come to work you can see the kind of relationship, she [supervisor] has with them because she is also White and they will talk, but once we show up, she will just direct you to go down there and work. She will never check up on you to see how everything is going. They (white coworkers) could be texting on their phones, and she would not say anything, and we (immigrants) were not even allowed to use our phones (I).*

Participants expressed feelings of hurt and disappointment when they were overlooked for promotions despite their hard work or when their supervisors did not value their qualifications and experience because they were from "poor" (a participant's own words) countries. A skilled and experienced welder participant recounted how he felt treated like "garbage" despite his specialist skills and was told to be a welder's assistant. Some participants experienced discrimination because of their poor language skills, while others experienced discrimination because of their religion.

> *Discrimination is everywhere. Especially if a person has poor English. At my first job, this language discrimination almost killed me. I felt depressed. Without proper English, you are nobody (V)*
> *As I see in my workplace, most of the parents do not like a childcare worker wearing hijab. That's why you will not see many Muslim women with hijab in my workplace. There are many parents who feel a lack of safety for their children who are under the care of a hijabi woman (U)…*

Many participants expressed dissatisfaction, noting a trend where immigrant employees faced a higher likelihood of job terminations or layoffs, often within their initial 3-month probationary period. They attributed this to a lack of awareness among new immigrants about occupational safety and failure to comply with workplace safety regulations. Additionally, new immigrant employees were told to take up jobs that Canadian-born employees did not like, and they felt that their performance was over-scrutinized. Others felt supervisors and coworkers perceived them as less capable. They constantly feared making mistakes and had the added stress of demonstrating competence. In most cases, however, participants tolerated racism, discrimination, and exploitation and rarely complained because of job insecurity and financial instability.

3.4 Developing a negative mindset

Several participants expressed feeling embarrassed due to their language barriers and accents. Some acknowledged feelings of inferiority stemming from a lack of familiarity with Canadian culture and an inability to "speak fast" like their Canadian-born peers. They felt offended when coworkers used terms that they did not understand towards them. Those who were used to the more friendly and informal working environments in their country of origin (for example, greeting coworkers, sharing food, and sharing information about family) felt ignored and ostracized when coworkers and supervisors did not acknowledge their greeting. One commented, "This kind of situation makes me upset and frustrated, and I lose interest in doing my work." Another participant related how she felt insulted each time she asked questions, and her supervisor responded with irritation. Such experiences made some participants develop negative mindsets and behaviors. They experienced loss of motivation and interest in their work. They started limiting their interactions and socialization with their white Canadian coworkers. They kept to themselves and, as reported by one worker, "minded my own business." Self-consciousness about their accent, lack of confidence in their language skills, and fear of being insulted restricted them from asking questions, an essential aspect of Canadian workplace norms. There were participants who, despite working in unsafe conditions, blamed themselves for their injury, for either being careless or forgetting what was taught during their orientation regarding safety procedures at work. Referring to some of her newly hired immigrant colleagues who had sustained injury and were blaming themselves, a participant explained:

> *By blaming themselves, these employees are normalizing injustice. They are very stressed and frustrated but accept exploitation because they have mortgages on their house and loans to repay (L).*

3.5 Contextual factors

While job and financial insecurity were the critical contextual factors that made participants put up with distressing workplace conditions, language and communication challenges added to their distress. Other contextual problems that caused frustration included inadequate occupational health and safety (OHS) knowledge, poor understanding of Canadian workplace culture, and lack of social networks. Regarding OHS, most participants knew they should follow safety rules and use protective gear. Still, their knowledge of OHS was insufficient, especially concerning their employee rights. While many participants knew they could refuse unsafe work, they were unaware of the employer's responsibility to provide OHS training and a safe workplace. They were not informed about the procedures to report injury and the availability of support like worker's compensation and disability leave. This resulted in many injured workers experiencing considerable stress after sustaining injury. Very new participants, for example, those under five years of residency in Canada, did not know they could have short breaks between work hours and were entitled to overtime pay. Lack of awareness made these participants take on unsafe work and agree to work longer hours, sometimes without overtime pay. Reflecting on the behaviors of some of his immigrant coworkers, one participant commented:

> *They keep silent because they want to prove themselves to the employer that they can do everything better and fast. Sometimes they don't see the shortcut they take can affect their job quality and they will end up with something unsafe (A).*

Another contextual factor that added to participants' feelings of job insecurity and frustration was the lack of social networks, like relatives and friends whom they could turn to for advice on Canadian workplace cultural norms and safety legislation. Referring to these limitations, a participant explained:

> *For Canadians, they might have their family members, like relatives or parents to provide information (about workplace norms, safety legislation, and worker rights) to them. They may have already accumulated different experiences or knowledge such as workplace safety and working norms from Canadian society. However, for immigrants, they do not have the people who could provide this information. It is very difficult for them to obtain the same kind of information. It could become the excuse for their termination (C).*

3.6 Coping with distress

Participants showed resourcefulness in coping with workplace-related stress, utilizing diverse individual, cultural, and contextual strategies. These can be grouped into three categories: distracting and distancing, changing mindset and developing positive thinking, and actively seeking friends and community support.

3.6.1 Distancing and distracting

Participants tried to distract themselves from their work-related stress by participating in activities like attending church, praying, watching movies with children, window shopping, pursuing hobbies, or engaging in housekeeping. Others undertook self-care activities like yoga, salsa dancing, walking, biking, or gym. At least two participants had distanced themselves from work by taking stress leave. However, taking leave did not help as the conditions at work did not change. This led to these participants eventually quitting their jobs. A third participant mustered the courage to speak with her senior supervisor about the harassment she was experiencing and was able to get a transfer to another department.

3.6.2 Changing mindset and developing positive thinking

A participant who felt isolated in her workplace because of language barriers started attending English courses to improve her language skills. Unfortunately, she had to quit because, in her own words, *"It was almost a waste of time. It was very difficult to study anything after 10 – 12 hours of the working day. My brain did not want to accept new information"*. Another participant said he was trying to become more friendly with his Canadian-born co-workers and not take their teasing personally. Volunteering at her child's school helped a participant learn more about Canadian culture, which, in turn, was helpful at her workplace. A participant who was very unhappy at his job said his mindset changed after going to church and participating in some community events. He started to feel that he was fortunate that he could immigrate to Canada and find a job, although the job that he had was not the best.

3.6.3 Seeking friends and community support

Strategies under this category included seeking friends with similar experiences and developing a social network comprising immigrants from their own country and other countries. These underscore the significant role of community support to help immigrants cope with work-related stress. Only one participant said that he was seeking the help of a counselor to help him deal with work stress. Two participants were being treated by their doctors for depression and were on medications. None of the other participants reported seeking professional help to deal with their stress.

4 Discussion

This qualitative study examined the work experiences of recent immigrants who were engaged in precarious employment and the influence of these on their mental health. The study findings add to the small but growing body of evidence (7, 11–14, 22, 24, 45) that workplace challenges like those experienced by the study participants, job insecurity, and financial instability can deleteriously impact the mental health of precariously employed workers. Figure 1 offers a nuanced understanding of the complex intersections of mental health, unsafe employment conditions, negative mindsets that employees may develop, contextual factors, and coping strategies that employees may use to deal with their challenges. While the hazardous work conditions and risks identified in this study can adversely affect the mental health of all employees engaged in precarious work, in the case of recent immigrants, these intersections can compound the stressors impacting their mental health because of the multiplier effect of contextual factors associated with their immigrant status.

The psychological problems identified by the study participants reflect a predominantly psychosocial rather than a clinical conceptualization of mental health and well-being. As indicated earlier, mental health assessment in this study was based on subjective accounts of participants' mental state. Given the personal nature of all psychological experiences and ongoing debates about the utility of diagnostic measures (39), this was not considered a limitation. Since no standard mental health measures were used, it was difficult to say from the participants' reports whether they were experiencing distress or illness (depression, anxiety, or common mental disorders) (46, 47). Participants' reports of body aches and pains, crying, headaches, exhaustion, and difficulties with sleep provide valuable insight into how mental ill health (distress/illness) may be expressed in immigrant populations (46, 47), a finding that is significant for service providers and employers.

With specific reference to the eighty-one percent of study participants who were highly skilled but performing jobs much below their qualifications and skill level, current findings suggest that such immigrants may experience a higher risk of injury and mental health problems compared to other employees in precarious employment. These findings complement previous research (48). Overqualified participants in the current study knew that their injury was due to a lack of fit between their qualifications and current job demands and their work not matching their interests. One of the reasons for their injury, as indicated by current findings, is that many participants had no experience performing labor-intensive jobs in their country of origin. Not having received any training to perform such jobs in Canada, their bodies may not be able to adapt quickly enough to manual labor demands as it may take 8- 12 weeks for muscles to adapt, and between manual labor, rest is needed for the tissues to heal (49, 50). This can partly explain their physical distress/injury. Second, it has been suggested that many qualified and skilled immigrants derive their sense of identity and self-perception from their social and professional status (19, 51). Being granted PR status based on their professional abilities and skills, the failure to get professional jobs, and the loss of identity and social status accompanying this can lead to unhappiness, frustration, and anxiety (19, 51). Additionally, overqualification can lead to de-skilling (20). This process refers to the loss of skills and knowledge that accompanies the underutilization of immigrants' skills, an essential factor that can impact mental health (52). In summary, the impact of precarious employment conditions on overqualified recent immigrants may be more profound than on other precariously employed persons due to their higher risk of sustaining an injury and factors such as deskilling, loss of identity, and social and professional status.

Understanding the negative mindsets of recent immigrant employees is complex, as multiple factors can influence these. There is little research that has examined how negative mindsets develop and the impact of these on the employee's attitudes and behaviors. Current findings suggest pathways through which these may develop in new immigrant employees and affect workplace behaviors. As indicated by Wallace et al. (53), these behaviors could be emotional distress responses of participants as a reaction to experiences of racism and discrimination. Recent immigrants may use these responses to protect themselves from future hurt. However, these responses can be interpreted negatively by employers/supervisors, leading to recent immigrant employees being perceived as less intelligent, trustworthy, and employable and failing to integrate (54, 55). Such perceptions can influence the employer's interactions with these employees, which, in turn, can negatively impact them. The urgency and importance of addressing the negative mindsets of immigrant employees is evident. It requires a multidimensional approach that combines supportive policies, cultural awareness training, mental health interventions, and efforts to foster inclusive work environments.

Coping strategies can play a significant role in reducing the impact of stressors. In terms of the coping strategies used by participants, many of these align with previous studies (56). The findings suggest that the participants used constructive and nonconstructive coping strategies. Nonconstructive strategies, such as taking stress leave, did not help their situation as their work conditions did not change. In contrast, constructive strategies were helpful, like developing a social network or changing their mindset by reinterpreting their work and life situation as a positive experience. The failure on the part of participants to use professional help to cope with their mental health issues could be due to their lack of knowledge and familiarity with available services, cultural taboos about using these services, and language barriers. Further research on the effectiveness and accessibility of coping strategies is necessary to improve the well-being of immigrant worker populations in the workplace.

The findings of our study, while focused on recent immigrants, have significant implications for the mental health and well-being of all precariously employed individuals. Many of these individuals perform jobs that are below their capacity, qualifications, and skill levels (7). Given that poor mental health can have a substantial impact on productivity, increase the risk of accidents, and affect various aspects of one's life, policymakers should urgently address the growing prevalence of precarious employment and its impact on employees. The following section discusses the policy and practice implications for recent immigrants.

4.1 Implications for policy and practice

The government, service providers, and employers have a significant role in reducing the health impact of precarious employment on recent immigrants who are at greater risk than other employees of experiencing underutilization of their qualifications and skills and sustaining a physical and psychological injury because of the contextual factors associated with their immigrant status. Although detailed policy and practice recommendations are beyond the scope of this paper, we provide some practical suggestions based on research and current findings. We recommend that Canada's current policy of inviting skilled immigrants into the country but not ensuring they get suitable employment be reviewed to ensure that immigrants can utilize their skills and qualifications in a just and inclusive work environment. The current policy violates social and occupational justice principles by failing to provide equitable opportunities for meaningful and appropriate employment. We also recommend that the rhetoric of Canadian work experience promoted by the state to facilitate labor market integration of new immigrants be set aside. To demonstrate Canadian work experience, immigrants must resort to unpaid or low-paying jobs, and some may even sustain work injuries in the process, as in the case of some participants in the current study. These practices result in the deskilling of immigrants and subject them to "processes that can reproduce immigrant workers in the lower echelons of a gendered and racialized labor market" [(57), page 3]. Occupational therapists (OTs) can play a crucial role in addressing occupational justice for new immigrant workers. By advocating for fair and inclusive employment practices, OTs can help ensure that immigrants have access to work that aligns with their skills and qualifications. Furthermore, OTs can develop targeted interventions to support immigrants in overcoming barriers to equitable employment, thereby promoting their overall well-being and integration into the labor market.

To minimize the risk of work injury among recent immigrant employees, the government should invest in providing OHS training before they take up employment or soon after. The government can fund Immigrant-serving organizations to offer this training to new immigrants. Equipping immigrants with OHS knowledge is a crucial first step, as this will help them understand their rights and obligations, build their confidence and empower them to navigate the workforce, reduce vulnerability to workplace injury, and improve mental health. To minimize the risks of immigrant skill underutilization, it has been suggested that the government should introduce guidelines for bridging immigrants' foreign credentials and working experience with their settlement and integration (58). It can invest in practical workforce development and training services for immigrants who want to access or transition into safer employment. The government can invest in occupational therapy services through employment services and immigrant-serving organizations, including the following: job matching and career counselling to advise and assist newcomers in accessing specific professional education and competencies, language training, fast-track programs, and fee waivers from educational institutions (59); cultural awareness training which can include 'soft' skills training for improving workplace communication and relationship building, teaching new immigrants about Canadian workplace culture and norms, culturally appropriate ways of interacting with coworkers and supervisors, confronting racism, workplace bullying, and harassment (52); and mentorship programs for personal and emotional support, workplace knowledge and professional network development (60). Such programs have the potential to mitigate the risks of deskilling and underutilization of immigrant skills and the development of negative mindsets and their associated health impacts.

Employers have a critical role in improving workplace conditions for all employees engaged in PE, specifically for vulnerable workers like qualified recent immigrants. However, given the steady rise in precarious employment, which has encouraged many employers to maintain a flexible workforce and compromise on employment and safety standards (4), and growing evidence of the adverse impact of PE on employee health, the government has the responsibility for instituting measures that can increase employer accountability towards employees and create safe and inclusive workplaces that can promote the mental health and well-being of all employees, especially those who are most at risk like skilled newcomers. Though research on workplace interventions for reducing the impact of PE on employee health is in its early stages (61, 62), we provide the following practical suggestions based on participants' experiences. The government can (a) support the development and dissemination of education for employers on the health impacts of PE on employees, especially new immigrants, and the work conditions and contexts that give rise to these; (b) implement stricter laws and regulations that can serve as incentives to employers to create safe and culturally inclusive workplaces (61, 63), and (c) support the development and uptake of cultural diversity training for employers (HR personnel and managers) that can help to address their biases towards new immigrant employees, their overseas qualifications and skills (6). Practical strategies that employers, on their part, can undertake include implementing policies that offer more predictability in hours, which can counter responses of overwork and presenteeism (40) and address discrimination and harassment in the workplace. Employers can provide mentors to new immigrant employees so that they can integrate and have equal opportunities for career advancement within the organization. Employers (and human resource managers) can invite healthcare providers to provide training that will help managers recognize the signs of mental ill health, especially among their immigrant employees, the workplace challenges and contexts that give rise to these, and the cultural taboos that are associated with talking about mental ill health. This can help in the early recognition and referral of troubled employees to healthcare providers for support. In addition to these measures, occupational therapists can offer concrete support by developing workplace mental wellness programs, tailored specifically for immigrant employees. They can conduct workplace assessments to identify and mitigate potential physical and psychological hazards that disproportionately affect immigrant workers. By collaborating with employers, OTs can help design culturally sensitive work environments and provide ongoing support to ensure the well-being and productivity of immigrant employees.

The uptake of the suggested recommendations depends on current neoliberal governments' willingness to invest in the workforce development of newcomers and not leave these solely on the shoulders of new immigrant employees or their employers. It also depends on employers' interests and resources to create safe and inclusive workplaces. Delays in implementation will not only increase the risk of poor mental health and disability among vulnerable workers but can affect the country's economic and social development.

4.2 Study limitations

The following are some of the study limitations. First, the sample for this study was drawn from only two geographic sites in a province. Since both sites were urban, we do not know about the challenges that recent immigrants have faced in rural and semi-rural areas. Second, the study sample is weighted toward professionally qualified immigrants, though the recruitment strategy didn't specifically target this group. Third, the sample was primarily comprised of service users of immigrant-serving organizations. These service users' experiences and health effects may differ from those of recent immigrants who do not use these services. Future research must include service users from this latter group. Fourth, this study focused only on recent permanent residents. Future research should include a comparison with other vulnerable populations, such as temporary foreign workers, which can provide information on whether employees with PR status in PE are better off than other immigrant groups. Fifth, given this study's design, it was not possible to determine the role of external factors like migration and loss of family and friends and their influence on participants' mental health. Despite these study limitations, the research results are nonetheless significant regarding their implications and contributions for Canada and beyond.

5 Conclusion

This study is one of the first few qualitative studies to examine the mental health challenges of recent immigrants in precarious employment contexts. More than two-thirds of the study participants were overqualified for their jobs. The study findings extend beyond workplace conditions and offer a nuanced depiction of the various factors influencing mental health. The findings highlight several psychological problems that participants experienced and four intersecting key themes that influenced their mental health. These include challenging workplace conditions, recent immigrant mindsets, contextual factors, and coping strategies used to deal with distress. The study findings suggest that recent immigrants taking up precarious employment are at high risk of developing mental health problems and that overqualified immigrants may be more vulnerable to sustaining both physical and psychological health problems. Based on the findings, a multidimensional approach is proposed for addressing workplace conditions and promoting the mental health of recent immigrants. This approach underscores the urgent need for policy and legislation changes, as well as programs for creating awareness among employers about the importance of the mental health of recent immigrant employees and the crucial role of employers in creating safe and culturally friendly workplaces where each worker feels safe, respected, and valued. The approach also recommends that recent immigrant employees receive occupational health and safety training, access services to learn about Canadian workplace norms and culturally appropriate ways of interacting with coworkers and supervisors and receive timely health care support.

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.

Ethics statement

The studies involving humans were approved by The Conjoint Faculties Research Ethics Board (CFREB), University of Calgary. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided written informed consent to participate in this study.

Author contributions

JS: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. S-PC: Writing – review & editing, Visualization, Validation, Resources, Methodology, Formal analysis, Conceptualization. DL: Writing – review & editing, Visualization, Resources, Methodology, Funding acquisition, Conceptualization. SJ: Writing – review & editing, Visualization, Validation, Software, Investigation, Formal analysis, Data curation. RN: Writing – review & editing, Visualization, Formal analysis, Data curation. ZS: Writing – review & editing, Visualization, Validation, Resources, Investigation, Formal analysis, Data curation. AA: Writing – review & editing, Validation, Software, Investigation, Formal analysis, Data curation. PK: Validation, Resources, Investigation, Writing – review & editing.

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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.

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Appendix

Appendix: Guiding Questions

– Information about self.

– Description of their job

– Kind of experience, training, or educational qualification received

– How do they understand occupational/work safety and workers' rights?

– About awareness of the right to refuse work.

– How do safety issues in the workplace affect health, mental health, and well-being?

– Satisfaction with workplace conditions and relationships?

– How does work impact family life and vice versa?

– How they have kept themselves from not being injured

– Reasons why immigrant workers refrain from reporting workplace injury/illness or claiming worker's compensation for injury

– Familiarity with the workplace's hiring and termination practices?

– Awareness of job benefits

– How can occupational safety and well-being be improved?

– Perspectives on overall well–being:-

Additional questions for injured

– Experience of injury, type, severity

– How do they cope with circumstances of post-injury/illness?

– How do they cope with their financial situation after an injury?

– Awareness of the company's policies and practices if anyone sustains a workplace-related injury.

– Awareness of support after a work injury, access to support, barriers to accessing support, and satisfaction with support received.

– Types of workplace accommodation provided

– Views on improving your return-to-work outcomes?

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Cognitive Orientation to daily Occupational Performance (CO-OP) for mood, anxiety, and adjustment disorders: a pilot study

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Introduction: Global mental health issues, particularly anxiety and depression, significantly impact people's everyday activities. While psychotherapies are commonly used, there is a growing interest in problem-solving approaches within mental health. These approaches focus on enabling individuals to develop personalized strategies to address emotional and psychological challenges and enhance their engagement in meaningful activities, known as occupational performance. This paper examines the feasibility of the Cognitive Orientation to daily Occupational Performance (CO-OP) in assisting adults with mood, anxiety, or adjustment disorders.

Method: The study employed a mixed methods single-subject design with replication, using an inductive/deductive approach for qualitative analysis. Ethical approval was obtained, and participants were recruited from a Singaporean hospital's occupational therapy service. CO-OP sessions were conducted either in-person or via telehealth. The intervention involved setting goals collaboratively, followed by weekly sessions over 10 weeks. Various data sources, including demographics, field notes, recordings of sessions, assessments and interviews were collected. Data analysis involved comparing pre- and post-intervention scores, thematic analysis of interviews, and triangulation of quantitative and qualitative data for validity. The study results are organized according to five feasibility domains: acceptability, demand, implementation, practicality, and limited efficacy.

Results: A total of 10 participants, mostly female, were recruited, with two dropping out during the baseline phase. All remaining participants completed the intervention and 1 month follow-up data collection. CO-OP was perceived as acceptable and beneficial in enhancing occupational performance, satisfaction and managing mood and anxiety symptoms. Participants expressed increased confidence and self-efficacy but desired continued therapist support for strategy application and reinforcement.

Discussion: Participants generally embraced CO-OP, favoring its personalized nature over therapist-directed approaches, with high retention rates observed.

Building a strong therapeutic relationship was essential. Also using complementary approaches like supportive counseling proved beneficial. CO-OP emerges as a viable intervention alongside existing therapy approaches, offering a promising avenue for addressing the complex needs of individuals with mental health conditions.

KEYWORDS

occupational therapy, mental health, Cognitive Orientation to daily Occupational Performance, CO-OP, mood disorder, anxiety disorder, adjustment disorder

1 Introduction

Mental health concerns, particularly anxiety and depression, are increasing globally (1). They remain major causes of disability worldwide (2) and significantly impact various aspects of peoples' lives (3, 4). These disorders can hinder everyday activities such as self-care, work, home management, and social interactions (5, 6). Occupational therapists in mental health settings play a crucial role in supporting people to cope with emotional and psychological challenges and facilitate their engagement in meaningful activities, known as *occupational performance*.

Psychotherapies are commonly used to support individuals experiencing anxiety and depression (7). These therapies encompass various mental health approaches aimed at improving psychological, emotional, and behavioral symptoms. While psychotherapies are widely researched and found to be effective in reducing symptoms, their impact on improving occupational performance remains inconclusive (8–11). Although occupational therapists in mental health settings have traditionally applied such approaches, there is a growing interest within occupational therapy in problem-solving interventions directly addressing individuals' ability to perform their occupations, referred to as occupation-centered practice (62).

One such problem-solving approach that focuses on enabling individuals to develop personalized strategies for achieving their occupational goals is the Cognitive Orientation to daily Occupational Performance (CO-OP) (12). CO-OP is a metacognitive, person-centered approach that empowers individuals to identify cognitive strategies for enhancing occupational performance through an iterative process of performance analysis and guided discovery (13). The objective of CO-OP is to improve occupational performance through skill acquisition, utilization of cognitive strategies, application of learning to real-world activities, and transfer of learning to novel situations. The intervention format is based on the use of a global problem-solving strategy, "Goal-Plan-Do-Check" (GPDC) (12, p. 48). CO-OP is a complex intervention that consists of seven main elements: namely: 1) Client-chosen goals, 2) Dynamic performance analysis, 3) Cognitive strategy use 4) Guided Discovery, 5) Enabling Principles, 6) Significant other involvement and 7) Intervention format (12, p. 48).

CO-OP, originally designed for children with developmental coordination disorder (14, 15), has been further researched with a range of other pediatric populations, such as children with neurodevelopmental disorders (16), acquired brain injury (17), intellectual disability, and cerebral palsy (18, 19). Within the adult population, CO-OP has been found to be effective in patients with motor and cognitive difficulties post-stroke and traumatic brain injury (20, 21). Additionally, CO-OP has been explored in adult populations with hand injury, Parkinson's disease, and various conditions associated with cognitive impairment (22–25).

The evidence for using CO-OP with adult populations is evolving and indicates positive outcomes. For instance, the global problem-strategy taught in CO-OP was found to be effective in promoting long-term gains in occupational performance and satisfaction with goals set by individuals following traumatic brain injury (26). Results also demonstrated that the effects of global metacognitive training strategies were generalizable to different contexts and transferable to new goals. In a randomized controlled trial of CO-OP with upper extremity burns, patients showed improvements in occupational performance and satisfaction, in addition to improvements in anxiety and depressive symptoms (27). However, while conducting CO-OP with adult populations, some adaptations to the original CO-OP protocol have been reported as necessary, such as modifying the involvement of significant others or adjusting the duration and frequency of treatment sessions (21, 26, 28, 29).

Given the initial success of CO-OP with diverse adult populations experiencing mood and cognitive difficulties (27), there is potential for CO-OP's guided, problem-solving approach to be beneficial for people with other mental health conditions. This paper will address the feasibility of administering CO-OP to individuals with mental health issues. Feasibility will be assessed based on five relevant domains described by Bowen et al. (30), namely acceptability, demand, implementation, practicality, and limited efficacy.

2 Materials and methods

2.1 Study design

A mixed methods single-subject design with replication was used for the study, employing an inductive/deductive approach for qualitative analysis (31, 32). This study received approval from the

Domain Specific Review Board (No. 2019/00049) of the National Healthcare Group and the Singapore Institute of Technology Institutional Review Board (No. 2019121). Written informed consent was obtained. Participants paid for their sessions; however, they were compensated with a $30 supermarket voucher per visit.

2.2 Participants

Participants were purposively recruited from the occupational therapy service at a large tertiary hospital in Singapore between 2019 and 2021. This service was seeing a large group of people with mood, anxiety and adjustment disorders and were interested in possible interventions for this population. Thus, the inclusion criteria were: (1) a diagnosis of a mood, anxiety, or adjustment disorder; (2) aged between 21 and 65 years; (3) medically stable; (4) proficient in English; (5) capable of providing informed consent; and (6) referred for outpatient mental health occupational therapy services. Exclusion criteria were people with a degenerative neurological condition or people who were unable to identify goals they wished to address during the sessions.

2.3 Procedures

CO-OP sessions were conducted in an outpatient hospital setting. Due to the evolving COVID-19 situation at this time, participants recruited in 2021 were given the option to choose between in-person or telehealth sessions. Despite this provision, only one person opted for telehealth for two out of their ten sessions. The intervention was delivered by an experienced occupational therapist certified in the CO-OP approach. Hour-long individual sessions took place once weekly, spanning over 10 weeks. The first session involved collaborative goal setting, facilitated by the therapist. Subsequent sessions involved the therapist introducing the global problem-solving approach (GPDC), reviewing goal attainment, and refining strategies generated and applied by participants if goals were not met. Additionally, the therapist provided session handouts that summarized the strategies and plans for each participant to take home after each session.

2.4 Data collection

Table 1 provides a summary of the quantitative and qualitative data sources collected and triangulated to assess the five domains of feasibility. The study gathered qualitative data via semi-structured interviews, field notes, and video/audio recordings across all five criteria (Acceptability, Demand, Implementation, Practicality, and Limited Efficacy). The study employed several quantitative measures to complement the qualitative insights. For assessing Acceptability, the Treatment Acceptability/Adherence Scale (TAAS) provided numerical data on how acceptable participants found the intervention. Demand was assessed via the recruitment and retention rates. To ensure proper Implementation, the CO-OP Fidelity Checklist offered quantitative data on the fidelity of the intervention's execution according to established standards. Additionally, the study utilized several other quantitative measures for determining Limited Efficacy: the Canadian Occupational Performance Measure (COPM) and the Performance Quality Rating Scale (PQRS) provided scores reflecting the quality of performance in various activities from both the participant's and therapist's perspective respectively; the Patient Health Questionnaire-9 (PHQ-9) measured the severity of depressive symptoms; and the Generalized Anxiety Disorder-7 scale (GAD-7) quantified the severity of anxiety symptoms.

As shown in Table 2, data was collected at baseline (T1), CO-OP sessions (T2), final CO-OP session (T3) and 1-month follow-up (T4). At T1, the baseline measures were repeated weekly for three weeks. The CO-OP fidelity checklist (70) was rated based on sessions three, six and nine for each participant as per Yosef et al. (33). For participants who did not complete all ten weekly sessions, one session from each third of the total number of sessions were sampled. All measures were administered by unblinded research assistants, except for the COPM and PQRS, which were completed by the occupational therapist.

2.5 Data analysis and reliability

To examine primary efficacy in improving occupational performance, pre- and post- intervention scores were compared for COPM and PQRS. COPM data was analyzed for normality using the Shapiro-Wilk test. The Wilcoxon Signed Rank test was used as not all the data was normally distributed. In addition, to examine efficacy in symptom reduction, scores for PHQ-9 and GAD-7 were plotted on graphs for visual analysis of levels, trends and consistency (34). To improve validity of findings, quantitative data was triangulated with qualitative interviews (35).

Interviews were de-identified and transcribed verbatim. An inductive/deductive thematic analysis approach was used to allow targeted analysis of study objectives while identifying new patterns in data (28, 32, 36). A coding frame was developed following Roberts et al. (32), with reference to the format by Boyatzis (37). This coding frame ensured greater inter-rater reliability for the coding of qualitative data (32). The coding frame included predetermined categories based on the five domains of feasibility (30), and a literature review of CO-OP. The frame was iteratively refined after its application to two initial transcripts by two study team members through discussion and consensus. Using NVivo 12 software, the frame was applied to the remaining transcripts, with codes sorted into predetermined categories, while new codes were derived inductively.

3 Results

3.1 Demographics and description of participants

A total of 10 participants were recruited (referred to as P1 to P10), among whom nine were female and one was male (P10). Two

TABLE 1 Data sources and the five domains of feasibility.

	Acceptability	Demand	Implementation	Practicality	Limited Efficacy
Demographics questionnaire					
Field notes[1]	x	x	x	x	x
Video/audio recordings of sessions[2]	x	x	x	x	x
Semi-structured interviews[3]	x	x	x	x	x
Recruitment and retention[4]		x			
CO-OP fidelity checklist[5]			x		
Canadian Occupational Performance Measure (COPM)[6]					x
Performance Quality Rating Scale (PQRS)[7]					x
Patient Health Questionnaire-9 (PHQ-9)[8]					x
Generalized Anxiety Disorder-7 scale (GAD-7)[9]					x
Treatment Acceptability/Adherence Scale (TAAS)[10]	x				

[1] The therapist wrote field notes after each session reflecting on implementation of CO-OP, possible adaptations, and feedback (60).

[2] CO-OP sessions were audio and video recorded with permission from the participant to allow for post session analysis and interpretation of behavior (68).

[3] Conducted to understand participants' subjective experience of the intervention, providing insight into participant's perspective of feasibility (59). The interviews were video, and audio recorded and ranged from 30 to 60 minutes long.

[4] Descriptive data were collated regarding recruitment rate, retention rate, number of sessions rescheduled, and reasons for dropping out.

[5] Examines therapist's adherence to the CO-OP protocol for clinical or research purposes (61, p.16). The fidelity checklist was independently rated using the video of the sessions by at least two researcher assistants. In addition, a blinded CO-OP trained therapist randomly selected and scored 20% of the rated CO-OP sessions. 100% similarity was achieved.

[6] COPM is a standardized semi-structured interview to elicit goals for intervention sessions (65). It assesses self-perceived performance and satisfaction of identified occupational performance goals on a 10-point scale. Improvements by 2 or more points on pre-post scores of COPM indicate clinically significant improvements (65). COPM has been demonstrated to be an appropriate measure in detecting changes in levels of performance and satisfaction in persons with mental health disorders (59).

[7] PQRS is a therapist-rated observational measure of participant's performance quality in meaningful, personal daily activities. PQRS was designed to complement COPM by capturing therapists' perception of goal performance (66). Performance is rated on a 10-point scale, where '1' indicates that the activity was not performed at all, while '10' indicates that the activity was performed very well.

[8] PHQ-9 is a 9-item self-reported screening tool for severity of depressive symptoms (63). Higher scores indicate higher severity of symptoms. A change of five points or more suggests clinical significance. The PHQ-9 reported excellent internal and test-retest reliability, and good construct validity (64).

[9] GAD-7 is a 7-item self-reported measure designed to screen and assess the severity of symptoms of anxiety (69). A score of 10 and above suggests the presence of anxiety. The scale demonstrated good test-retest reliability and is specific and sensitive in measuring symptom severity (64).

[10] TAAS is a self-report measure consisting of 10 statements describing participant's response to treatment. Items are scored on a seven-point Likert scale (strongly disagree, neutral, strongly disagree), with a total score ranging between 10 and 70. A higher score suggests greater acceptability and predicted adherence to treatment. TAAS has been used to study novel treatment approaches for anxiety and related problems. It can also aid in providing information to further improve the novel approach based on the participant's self-reported answers (67).

participants dropped out during the baseline phase; P6 cited a change in priorities, while P10 was uncontactable. The demographic information of the remaining eight participants is presented in Table 3. All the participants met the inclusion criteria in having mental health diagnoses; in addition, three participants had co-morbid diagnoses (i.e. Autism Spectrum Disorder, Attention Deficit-Hyperactivity, Learning Difficulties, and Social Communication Disorder). All eight participants completed the CO-OP sessions and follow-up phases. The results of the study are organized according to the five domains of feasibility chosen, namely acceptability, demand, implementation, practicality, and limited efficacy (30).

3.2 Acceptability

3.2.1 Overall acceptability of the approach

Mean TAAS scores consistently trended in the upper range, ranging between 68.6% to 92.4%, with minimal fluctuations. This indicates moderate to high acceptability, which was consistent with participants expressing generally positive views towards the CO-OP approach.

Participants expressed enjoyment and increased motivation to participate in CO-OP sessions compared to other therapies, as highlighted by P8:

> *"I find that it was a good experience, and that I would definitely like to go through this therapy again, if possible, to better address the goals that I've set for myself".*

A common factor mentioned was how previously experienced therapies were more prescriptive, whereas CO-OP was individualized and personally meaningful. For example, P5 stated:

> *"I told her [the CO-OP therapist] that she's not the first person I've seen. I always end up feeling like whatever the person teaches or recommends [to] me doesn't work eventually, so I give up and don't want to meet them anymore. But for her, it's collaborative".*

During the T4 interview, all participants expressed that they would recommend CO-OP to individuals facing similar difficulties.

TABLE 2 Timeline of sources of data collection.

	T1 Baseline	T2 CO-OP sessions (biweekly)	T3 Final CO-OP session	T4 1 month follow up
Demographics questionnaire	x			
Field notes		x	x	
Video/audio recordings of sessions		x	x	
Semi-structured interviews			x	x
Recruitment and retention	x	x		
CO-OP fidelity checklist		x		
Canadian Occupational Performance Measure (COPM)	x		x	
Performance Quality Rating Scale (PQRS)	x		x	
Patient Health Questionnaire-9 (PHQ-9)	x	x	x	x
Generalized Anxiety Disorder-7 scale (GAD-7)	x	x	x	x
Treatment Acceptability/Adherence Scale (TAAS)		x	x	

3.2.2 Perceived appropriateness of CO-OP key elements

Participants expressed how they valued the active partnership fostered throughout the CO-OP sessions, contrasting it with previously experienced therapist-directed approaches. They perceived this partnership approach as enabling greater individualization of goals and plans, thus making them more realistic and personally meaningful. For example, P1 expressed preference for the CO-OP approach, stating,

> *"I prefer [a partnership approach] because then they'll be [considering] what you like and what is suited for you, and they won't throw me into something that I probably cannot actually do. And then they'll discuss different ways of handling [the situation/problem], instead of you know, just telling me what to do".*

Despite the value participants placed on working in partnership with the therapist on their goals, the use of the guided discovery

TABLE 3 Participants demographic information.

	Age	Sex	Race	Diagnosis	Employment status (Profession)	Marital status
P1	34	Female	Chinese	Anxiety with history of Autism Spectrum Disorder, Attention Deficit-Hyperactivity Disorder with learning difficulties	Unemployed (Library training during study)	Single
P2	41	Female	Malay	Generalized Anxiety Disorder	Unemployed	Married
P3	22	Female	Chinese	Adjustment reaction/disorder	Student	Single
P4	57	Female	Chinese	Mixed Anxiety Depression	Unemployed	Married (Divorce during study)
P5	29	Female	Malay	Anxiety Depression	Employed (Financial consultant)	Single (Married during study)
P7	24	Female	Chinese	Autism Spectrum Disorder with depression and mood dysregulation	Unemployed (Employed as retail assistant during study)	Single
P8	21	Female	Chinese	Social Communication Disorder – Adjustment Disorder	Student	Single
P9	45	Female	Javanese	Adjustment disorder with depressed mood and anxiety	Unemployed	Married

questioning technique was occasionally frustrating, particularly one participant who found it demanding in terms of their active engagement. However, the approach was generally positively received and reportedly facilitated feelings of autonomy, the development of personally meaningful plans, and promoted follow-through of the self-determined strategies.

Additionally, the Goal-Plan-Do-Check (GPDC) strategy was perceived as valuable for developing effective strategies, fostering a willingness for trial and error, and organizing thoughts. However, two participants reported not using it outside of the CO-OP sessions due to a lack of new situations to do so.

3.3 Demand

All participants who started the CO-OP sessions were able to complete the study, (i.e. data collection at all time points), resulting in a retention rate of 100%. However, only half of the participants (n=4) completed the full protocol of 10 weekly sessions. The 10 weekly sessions were not necessary for P2, who achieved all her goals by session seven. Participants P4 and P7 missed one weekly session, while participant P5 missed two weekly sessions with the main reasons being feeling unwell or forgetting appointments. Rescheduling was attempted and participants indicated their desire to continue, however the full 10 weekly sessions were not possible within the timeframe of the study. All participants completed the final data collection at T3 (final session) and T4 (one month follow-up).

Among the participants given the option for telehealth or in-person sessions, only P8 opted for telehealth for 2 out of 10 CO-OP sessions. They shared that collaboration was more difficult via telehealth, although it was more convenient than face-to-face sessions. In addition, during the post-intervention interview, P7 expressed a preference for in-person sessions due to the need for *"human touch"*. P9 elaborated further and expressed,

> *"Sometimes, the reception is not good, I cannot hear properly, I cannot see you all properly, and then I will get angry".*

3.4 Implementation

3.4.1 Success or failure and degree of execution

The CO-OP fidelity checklist scores were used to rate sessions 2, 4 and 6 for P2 and P5 who completed seven sessions, and sessions 3, 6 and 8 were rated for P2 and P7 who completed nine sessions. Fidelity for P1 was not rated, as consent was not given for recordings.

Overall 'across session' fidelity of 100% was obtained, with mean 'within session' fidelity of 96.8% for all participants, indicating that the therapist had a high quality of execution and compliance to the CO-OP protocol. For all sessions, above 80% of items had high quality of execution except one session for P3 and P7, where a large portion of the session was focused on supportive counselling instead of engaging in CO-OP.

3.4.2 Factors affecting implementation

Participants took time to clarify their desired goals, leading to frequent changes. As the therapist noted,

> *"One challenge is the constant change in goals and the need to remain relevant to new situations. Goals often become irrelevant or delayed due to changes in mood or life situations".*

In addition, administering the Performance Quality Rating Scale (PQRS) and Dynamic Performance Analysis posed challenges due to the nature of goals selected by participants. Many goals related to social interactions or changes to routines could not be directly observed during sessions and had to be evaluated through detailed discussions.

Participants' limited knowledge of what was involved in making progress towards their goals also made using the guided discovery technique challenging. The therapist found facilitating guided discovery *"taxing"*, requiring a delicate balance between providing task knowledge and encouraging self-discovery. Sometimes, the therapist directly supplemented participants' knowledge, particularly when extensive research would be required or when time constraints made self-discovery impractical. The therapist explained,

> *"It seemed difficult for her to generate ideas, and given her circumstances and lack of exposure to potential strategies, exploring on her own would have been challenging. Therefore, I decided to directly supplement task knowledge".*

The therapist's skilled management of participants' low mood and interpersonal events facilitated the implementation process. The therapist employed various strategies, such as supportive counseling and validating emotions, guided by other therapeutic approaches. Recognizing and switching approaches as needed enabled participants to experience catharsis and subsequently increased their engagement in the CO-OP sessions. For example, one participant mentioned to the therapist that,

> *"Just by talking about my situation in the last session, I felt much better. It almost felt like the last session prepared us to work more effectively today on problem-solving. I was able to dive into it and go straight into CO-OP today".*

3.5 Practicality

Participants' ability to learn, generalize, and transfer Goal-Plan-Do-Check (GPDC) and domain-specific strategies were examined.

Some participants encountered difficulties recalling GPDC steps when asked, yet demonstrated implicit application. For example, five participants successfully transferred GPDC to other situations. One participant introduced GPDC to her project group, while another went beyond the original planned strategy and developed a new way of managing a crowded supermarket. P9 described,

> *"I know the timing is like evening, people after office hours, they start to go [to the supermarket] already. So I go at noon, [or] about 2[pm]. Not a lot of people."*

Another example was a participant who found the GPDC strategy application natural, applying it to manage her children's behavior.

Participants expressed a lack of confidence at times in their plans. One participant voiced uncertainty regarding the effectiveness of her plans and sought assistance from the therapist to refine her ideas,

> *"I can probably come up with some ideas but not every single idea so I might need help with, you know, fixing that to make sure it actually works."* (P1)

Participants also expressed that their lack of confidence in their plans arose from apprehensions about unforeseen variables affecting plan success. For example, P8 reflected,

> *"everyone's responses might be different with regards to your plan,… [where] the other individual involved will be an unknown variable, so it'll be difficult to go through the entire plan sometimes".*

Some participants recognized the need for time to integrate strategies into their routines and develop new habits. P5 shared that,

> *"I believe habit takes time … there's a bit of a … challenge to implement that, because naturally, I see it a certain way … [and that cultivating new habits was] very uncomfortable … very time consuming".*

Some participants expressed the need for continued therapist support beyond the completion of their goals due to persistent struggles managing their symptoms. P4 expressed concerns that she would regress in her improvements and struggle to push herself. She felt that she required external pressure from the therapist, to still be

> *"accountable to this person, to tell this person that I'm moving on. It makes me stay on track, or else I will move backwards".*

P5 also shared that she still experienced herself spiraling into negative emotions, and that

> *"sometimes when the spiral is too deep it's very difficult to catch yourself".*

3.6 Limited efficacy

3.6.1 Occupational performance

Participants and the therapist rated improvements in 83.3% and 91.7% of their occupational performance goals, respectively (Table 4). In the Canadian Occupational Performance Measure (COPM), all participants reported clinically significant improvement in performance of at least two goals, with half of the participants reporting clinically significant improvements in performance for all three goals. A Wilcoxon Signed Ranks test showed that there were statistically significant improvements in COPM performance scores from pre-CO-OP to post-CO-OP sessions (Z=36.00, p = .012).

The positive outcomes observed were consistent with participants' personal experiences shared in the interviews, where they commonly perceived CO-OP as a beneficial intervention. They expressed satisfaction with their enhanced goal performance and their newfound ability to effectively manage their condition and associated challenges. For example, P9 articulated their contentment, stating,

> *"I'm satisfied right now lah like, I got improvement."*

Similarly, P2 recounted moments of breathlessness during public transport journeys but highlighted the efficacy of CO-OP strategies, noting,

> *"Eh! Okay what, I can manage myself."*

Interestingly, P5 acknowledged minimal changes in mood and anxiety symptoms but still perceived growth, stating,

> *"there's growth because, I can sleep - even though [it is] not to the benchmark I want. And I can [also] go [to the] office [which were my goals]."*

These transformations were evident not only to the participants but also to those within their social circles. P5 spoke about how their friends noted the positive changes, observing,

> *"When I'm having problems, I literally don't meet anyone … now, I'm starting to have activities and they [my friends] see improvements."*

Likewise, P9 shared how her husband's friends remarked,

> *"Your wife looks so different now"*

TABLE 4 Participant goals and respective COPM and PQRS scores.

		PQRS		COPM Performance			COPM Satisfaction		
				Mean (*SD*)^a			Mean (*SD*)^a		
	Goals	Start	End	Start	End	*W*^{a}	Start	End	*W*^{b}
				4.33^b	7.33^b	36.00*	3.50^b	7.67^b	36.00*
P1	Find a job	3	8	4.33 *(0.58)*	6.67^c *(0.58)*		4.33 *(1.53)*	7.33^c *(1.15)*	
	Travel independently	2	9						
	To be able to use a public toilet	3	7						
P2	Eat regularly and healthily	7	7	4.33 *(1.53)*	7.33^c *(0.58)*		4.00 *(2.00)*	7.33^c *(0)*	
	Regular relaxation routine	3	8						
	Regular physical activities	2	7						
P3	Learn to play cajon	6	8	4.67 *(1.53)*	6.67^c *(2.89)*		3.33 *(3.46)*	6.33^c *(4.04)*	
	Engage in art once per week	6	10						
	Pre-sleep routine 3 times per week	6	9						
P4	Engage in a pre-sleep routine	1	7	4.33 *(3.06)*	7.33^c *(0.58)*		5.33 *(4.51)*	8.33^c *(1.53)*	
	Routinely take care of self	4	6						
	Prepare a meal 2-3 times a week	5	9						
P5	Shower every morning	7	10	4.67 *(3.21)*	7.33^c *(2.52)*		2.33 *(2.31)*	9.33^c *(1.15)*	
	Sleep from 1-7am	2	7						
	Go to office on Monday	4	5						
P7	Communicate in a less angry way	5	7	3.33 *(1.15)*	7.67^c *(0.58)*		5.33 *(1.53)*	8.00^c (1.00)	
	Style own hair	4	6						
	Manage emotions	3	7						
P8	Completing school tasks	5	7	3.33 *(1.53)*	7.67^c *(2.08)*		1.00 *(0)*	7.00^c *(2.00)*	
	Starting a conversation	4	7						
	Continuing a conversational topic	4	10						
P9	Manage feelings of numbness	2	8	1.00 *(0)*	7.00^c *(0)*		1.00 *(0)*	8.00^c *(0)*	
	Manage feeling overwhelmed by crowds	2	8						
	Communication with mother: assertive	3	8						

[a] SD = standard deviation.

[b] W = Wilcoxon Signed Rank test. As Wilcoxon Signed Rank Test was used to analysis the difference in COPM Performance and Satisfaction scores, median scores are presented.

[c] For COPM, a 2-point change indicates a clinically significant difference.

*$p > 0.05$.

after she commenced the CO-OP sessions.

The problem-solving focus in CO-OP was perceived as a pivotal catalyst for change. P4 detailed its impact on her progress, stating,

> *"[The CO-OP approach] changed the way I look at things."*

Moreover, participants reported heightened confidence to engage in activities they previously avoided. P3 expressed this sentiment, saying,

> *"My confidence level [to do activities] has actually increased by 100%."*

3.6.2 Mood and anxiety symptoms

Figures 1 and 2 display the changes in depressive and anxiety symptom severity from T1 (baseline) to T2 (CO-OP sessions), T3 (final CO-OP session), and T4 (1-month follow-up).

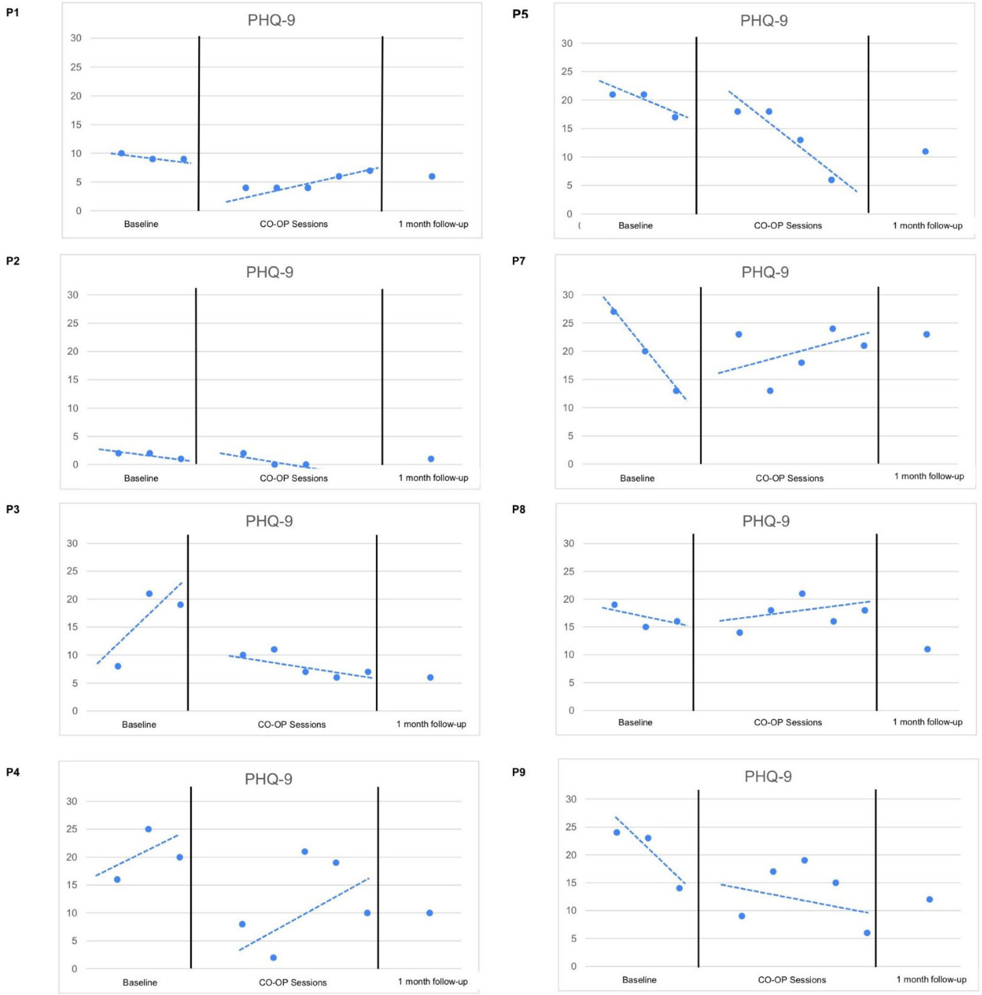

FIGURE 1
PHQ-9 Trends.

3.6.2.1 Trends

When examining the depressive and anxiety symptoms, P1, P7 and P8 had decelerating trends in symptoms during T1, followed by a change in trends in T2. This reflects no effect on symptom reduction during CO-OP sessions.

Interestingly, a floor effect was noted for P2, who had no to minimal depressive and anxiety symptoms from T1 to T2 but experienced a slight increase in anxiety at T4 due to new stressors unrelated to the goals she had previously worked on.

P3 had accelerating depressive and anxiety symptoms in T1, followed by a change in trend to decelerating symptoms in T2. This reflects a positive effect on symptom reduction during CO-OP sessions.

P4 had an accelerating trend in depressive symptoms in T1. T2 was characterized by increased variability, although there was no change in trend and slope. In addition, P4 had decelerating anxiety symptoms in T1, which continued with a similar trend and slope in T2. This reflects no effect on symptom reduction during CO-OP sessions.

P5 had a decelerating trend in depressive symptoms in T1, followed by an increased steepness in the slope in T2. In addition, P5 had accelerating trend in anxiety symptoms in T1, followed by a change in trend in T2. This reflects a positive effect on symptom reduction during CO-OP sessions.

P9 had a decelerating trend in depressive symptoms in T1, which was followed by increased variability in T2. In addition, P9 had a decelerating trend in anxiety symptoms in T2, and a change in trend in T2. This reflects no effect on symptom reduction during CO-OP sessions.

3.6.2.2 Levels

The level of anxiety and depressive symptoms reduced for 62.5% (n=5) of participants between the baseline and at the initiation of the treatment, further indicating a receptiveness to the treatment. When comparing T3 with T4, 50% (n=6) of participants reported maintained or further reduction of the level of depressive symptoms. Moreover, 87.5% (n=7) participants had lower levels of depressive symptoms at 1 month (T4) compared to

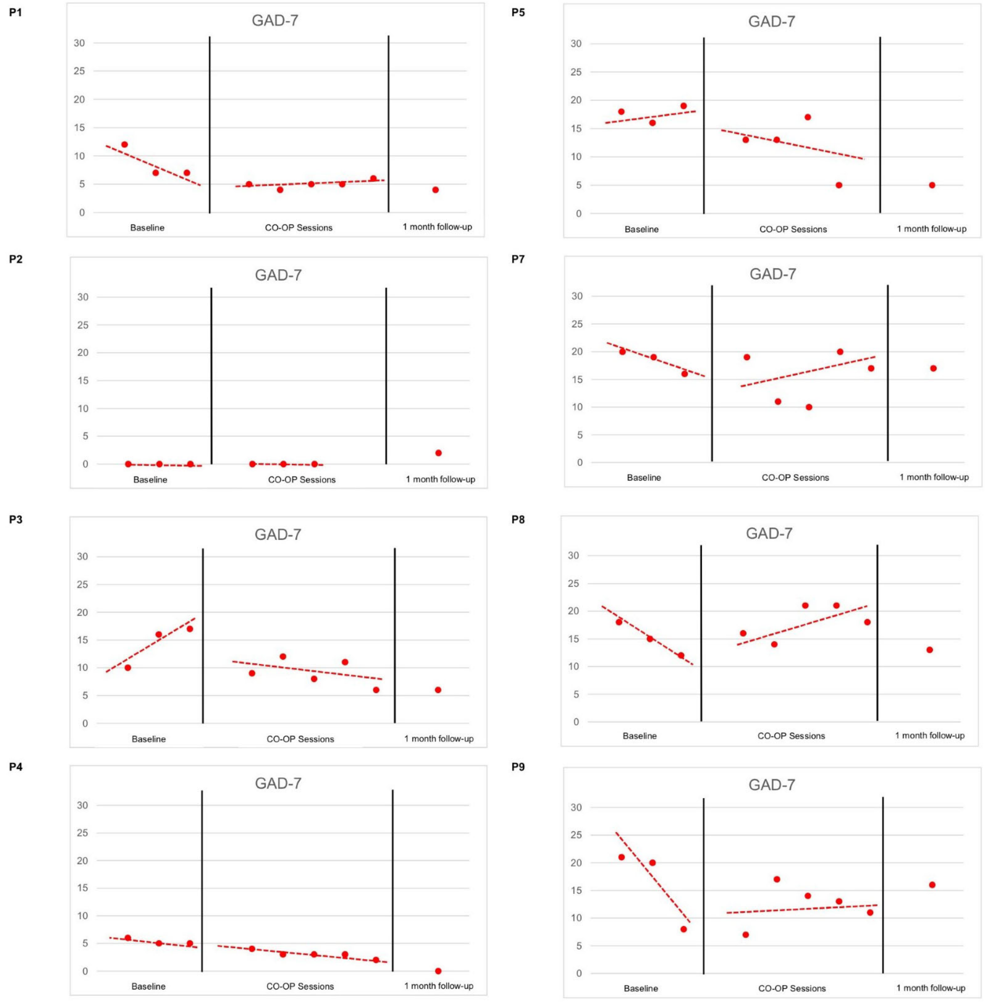

FIGURE 2
GAD-7 Trends.

baseline (T1). A majority 75% (n=6) of participants maintained or had further reduction in levels of anxiety scores between T3 and T4. Moreover, 50% (n=4) participants had lower levels of anxiety symptoms at 1 month (T4) compared to baseline (T1).

Despite most participants not having goals specific to symptom management except for P7 and P9, many noted in their interviews either a reduction in symptoms or increased acceptance of their symptoms. There was a sense of control and personal growth around their symptoms when they were able to use their strategies and participate in desired activities. For example, P1 expressed,

> *"But now that I've done something, I feel a little less anxious".*

Similarly, P3 remarked,

> *"I think after all the sessions, I'm not so scared of … doing the things that I like to do, in fact I'm like, doing it more often".*

Additionally, P4 emphasized,

> *"I need these strategies, or else I can be pushed back to the place where I first started. That is feeling discouraged. These strategies … change the way I look at things".*

3.6.3 Confidence

All participants highlighted their active involvement in CO-OP sessions as a positive contributor to their confidence. Having a plan provided structure and encouragement to initiate action towards their goals, while the flexibility to adapt their plans was reassuring for some.

P2 reflected on their initial apprehension, stating,

> *"At first, when we started the session I wanted to have someone to follow me […] in case I faint (laughs). But then [after sessions], I say ok what, I take public transport on my own, everything I can do it myself."*

P3 emphasized how CO-OP bolstered confidence, expressing,

> *"It [CO-OP] builds confidence in you la. It gives you confidence, like the things that you're scared to do, the things that you wish you could do, but never had the chance to do, it's like they give you the chance to do, then let's say if this plan is not working, then eh! You got plan B."*

Although CO-OP enhanced participants' confidence, some felt the need for additional sessions and guidance to reinforce and refine their strategies. For example, P5 articulated,

> *"Because these strategies are new to me so I believe habit takes time, so um no doubt sometimes I feel there's a bit of a challenge doing that."*

P1 acknowledged the potential benefits but expressed a need for assistance in developing the strategies, saying,

> *"I can probably come up with some ideas but […] I might need help with fixing that to make sure it actually works. But other than that, I think it might do something for my part if I thought about it."*

Recommendations to bolster confidence were suggested by participants. They included follow-up sessions and involvement of significant others (partners) for support in applying strategies.

Of the eight participants, 75% expressed low confidence in independently transferring GPDC or domain-specific strategies to other situations, advocating for continued therapist support. P9 emphasized the necessity, stating,

> *"I need more confidence … that's why I want [the therapist] to continue with me."*

P7 advocated for monthly check-in sessions with the therapist to review goals and plans. P1 stressed the importance of professional follow-up, noting that informal support from partners might not be as effective. However, P2 believed follow-up sessions were unnecessary unless new problems arose.

All participants recognized the importance of having a support system, which significantly contributed to intervention efficacy. P1 emphasized this, stating,

> *"If I didn't have the support right, I don't think I'll be able to … like reach it, I'll probably be … like a nervous wreck.".*

During the intervention phase, several participants involved their partners to aid strategy application or directly as part of their plans. They valued this support, as it helped them execute and refine their plans.

4 Discussion

This pilot study explored the feasibility of the CO-OP approach for individuals dealing with mood, anxiety, or adjustment disorders. Overall, the findings suggest that CO-OP holds promise as a feasible intervention. Factors such as demand, efficacy, and acceptability were generally favorable, albeit with some suggested modifications to the intervention format by participants. Despite high fidelity scores indicating adherence to key elements, the therapist encountered challenges during the implementation of CO-OP.

4.1 Acceptability

Participants generally embraced the CO-OP approach, favoring it over previously experienced therapy methods. This preference could be attributed to the personalized nature of CO-OP, where participants selected their own goals. They noted that CO-OP offered more flexibility compared to previously experienced approaches, which often felt rigid and difficult to apply in their daily lives. In addition, the active partnership and collaboration also contributed to the acceptability of the approach. The study findings are consistent with existing evidence highlighting the significance of the therapeutic relationship in therapy outcomes (38–42). The therapist's adept use of skills such as supportive counseling and validation of emotions proved pivotal during sessions, contributing significantly to the acceptability of the CO-OP approach. Moreover, the therapist's proficiency in discerning the individual's evolving needs amidst fluctuations in their mental health condition emerges as potentially crucial to the success of CO-OP this population.

However, challenges such as nonattendance persisted. In our study, the eight participants who continued beyond the baseline data collection were all motivated to complete the CO-OP sessions. Reasons given for nonattendance included forgetting appointments or being unwell, suggesting that motivation was less of an issue. This contrasts with other studies that identify motivation as a main contributor to nonattendance in this population (43, 44). Interestingly, other research indicates that adherence to treatmentintensity and frequency has long been a challenge in mental health practice, with studies showing that almost 20% of patients miss their scheduled treatments. This rate is approximately twice as high as that seen in patients with other conditions (45). In our study, participants were motivated to continue CO-OP sessions and complete their goals, although some people did request more time to do this, which was not possible within the timeframe of this study. Thus, the main implications are that more time may be needed to complete the CO-OP sessions for this population and additional administration may also be required to remind participants of their appointments and reschedule missed sessions.

Considering alternative methods of follow-up, such as telerehabilitation, may be beneficial. Telerehabilitation has gained popularity, particularly since COVID-19 (46, 47). Previous research on telerehabilitation for psychiatric interventions has generally shown positive results in terms of effectiveness and feasibility compared to traditional methods (33, 48, 49). However, our study found contrasting results, with low acceptability and demand for telehealth sessions, with participants preferring an in-person interaction. The primary obstacle encountered was concerns about technical difficulties. In future, therapists could explore broader applications of telerehabilitation beyond videoconferencing. This could include utilizing online forums, smartphone apps, text messaging, and emails for delivering mental health services (50, 51).

4.2 Efficacy

Through the triangulation of findings from this study, CO-OP yielded clinically significant improvements in both occupational performance and satisfaction ratings on the Canadian Occupational Performance Measure. This echoes findings from previous studies involving stroke and traumatic brain injury populations (26) as well as burn survivors (27), further underscoring CO-OP's potential efficacy in enhancing occupational performance among individuals with mental health conditions. Notably, most participants reported a reduction in mood and anxiety symptoms, despite not setting goals explicitly related to symptom management. However, the visual analysis of the trends and levels related to the PHQ-9 and GAD-7 suggested that only two participants had symptom reduction during CO-OP sessions. This may indicate that most participants may have experienced heightened symptoms during CO-OP sessions, as the process of problem solving to improve occupational performance could have been challenging, with the successes and setbacks experienced. However, upon reflection, after the completion of the CO-OP sessions, they felt that their symptoms had improved. Furthermore, even for those who did not experience symptom reduction, participants still derived benefits from employing strategies to enhance participation in daily activities and routines. This suggests that there may not be a clear correlation between symptom reduction and occupational performance.

Participants also expressed heightened confidence as a result of the CO-OP sessions. Similar enhancements have been observed in various adolescent and adult populations (28, 33, 49), where participants reported increased confidence in their ability to develop plans and manage daily activities. These improvements were attributed to the autonomy provided by designing their own plans through guided discovery. In our study, framing the intervention as a problem-solving approach may have mitigated participants' fear of failure, as the CO-OP approach allowed for time and space for experimentation and refinement of plans. Outcome measures associated with confidence could be a useful addition in future studies.

4.3 Practicality and implementation challenges

Despite high fidelity, the therapist identified multiple factors that increased the difficulty of implementing CO-OP. These were mainly participants' symptoms, complex goals, and limited task knowledge. Half of the participants experienced difficulties in learning, generalizing, and transferring GPDC independently. This contrasts with findings in previous studies, where participants across conditions were generally able to do so (21, 29, 33, 52).

As significant portions of certain sessions were spent supporting participants through fluctuations in psychiatric symptoms, the learning of GPDC may have been disrupted. It is possible that participants' psychiatric symptoms and other co-morbidities (e.g., Autism Spectrum Disorder, Attention Deficit-Hyperactivity Disorder with learning difficulties, Social Communication Disorder) may have been a barrier to learning and generalizing (53). Thus, the therapist identified supportive counseling as vital to prepare participants for engagement in CO-OP.

Moreover, the complexity of goals may have been another factor affecting the learning and application of GPDC and strategies. Similar to a study by Moxham et al. (54), the goals set were mostly social and organizational in nature. It is possible that the number of sessions was insufficient to practice applying GPDC for these complex goals, which are arguably more intricate than the motor-based goals set by children with Developmental Coordination Disorder, for whom the original protocol was designed (12). Additionally, prolonged goal-setting periods for some participants likely diminished the time available for learning and practicing GPDC. To address these challenges, some protocols have been adjusted to include double the number of sessions, as observed in previous studies (29, 55). These studies also incorporated intentional use of prompting questions and discussions to facilitate generalization and transfer beyond the intervention phase.

Furthermore, participants expressed a need for extended therapist support to apply cognitive strategies independently. This aligns with previous findings where participants expressed a desire for a gradual transition towards autonomy (28). Methods to facilitate this transition include booster sessions (29, 56) or a stepped intervention format (57). However, it is crucial to reconsider the overall number of sessions provided, given the prevalent difficulties within this population of non-attendance and their confidence in making life changes. Although participants expressed a desire for more support and ongoing sessions, it remains uncertain whether this would have enhanced occupational performance outcomes or led to problem-solving fatigue. Further investigation is warranted in this regard.

4.4 Implications for practice

CO-OP demonstrates promising results as an approach for improving occupational performance among people with mental health needs. When implementing the CO-OP approach in mental health settings, the use of supplementary mental health skills was found to be beneficial in the therapeutic process and in achieving participants' goals. Emphasizing the development of a strong therapeutic relationship and alliance is essential when delivering CO-OP. This is similar to the emotional support that is a core feature of Occupational Performance Coaching, which is a similar approach where people determine their own goals and use a problem-solving approach (58). Efforts should be made to build trust and create a safe environment during sessions, especially considering that individuals with mood, anxiety, or adjustment disorders may require greater emotional support.

Furthermore, broader adaptations may be beneficial to improve effectiveness in this population. Firstly, there could be more personalization of the intervention format in terms of the number of sessions, intervals between sessions, and involvement of significant others. Secondly, flexibility in delivering CO-OP would be beneficial to strike a balance between problem-solving, addressing participants' emotional needs, and adherence to appointment schedules.

4.5 Study limitations

The study has several limitations, including the limited diversity of participants in terms of gender and the presence of co-morbidities, which may hinder the generalizability of the findings to the broader mental health population. To address these limitations, a more rigorous follow-up study could be conducted, involving a larger and more diverse sample of participants with varying symptom severity and diagnoses. In addition, it will be important for future studies to consider if participant characteristics influence their attitudes and level of adherence to CO-OP. Protocols for future research should also consider the possibility of a high number of missed sessions and the potential differences in telehealth versus in-person delivery. Moreover, involving more than one therapist in the study can help determine if the treatment effect observed in this study can be replicated. Furthermore, to examine the transference of skills and assess long-term retention, future studies could incorporate a longer follow-up period.

5 Conclusion

This pilot study highlights the potential of the CO-OP approach as a feasible intervention for people with mood, anxiety, or adjustment disorders. Despite encountering implementation challenges such as nonattendance, and difficulty in learning and applying the problem-solving strategy, the findings underscored several positive aspects of CO-OP, including its acceptability, demand, and limited efficacy. Participants generally embraced CO-OP, favoring its personalized and collaborative nature over previously experienced therapy methods. Notably, the high retention rates observed in this study suggest a strong acceptability of CO-OP.

Practical implications include having an emphasis on building a strong therapeutic relationship using supplementary skills such as supportive counseling and validation of emotions to enhance therapeutic outcomes. Moreover, broader modifications to the CO-OP protocol, such as increased personalization and flexibility, may further enhance its effectiveness in addressing the complex needs of individuals with mental health conditions.

Data availability statement

The datasets presented in this article are not readily available because a data sharing agreement needs to be in place for data sharing. Requests to access the datasets should be directed to SW, suren.wong@singaporetech.edu.sg.

Ethics statement

The study involving humans was approved by National Health Group Domain Specific Review Board (DSRB) and the Singapore Institute of Technology Institutional Review Board. The study was conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SW: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing, Software. MC: Formal analysis, Investigation, Writing – original draft, Writing – review & editing. EC: Formal analysis, Investigation, Writing – original draft, Writing – review & editing. KD: Supervision, Writing – original draft, Writing – review & editing.

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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

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Recent onset mental illness severity: pilot study on the role of cognition, sensory modulation, and daily life participation

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Introduction: Early detection of individuals at risk for onset of severe illness is crucial for prevention and early intervention, aiming to mitigate the long-term impact on both the individual and the community. While well-established models exist for predicting the onset and prolonged severity of illness, there is a gap in understanding illness-onset severity. This pilot study aimed to investigate premorbid objective and subjective dimensions of participation in daily life occupations, as well as sensory and cognitive functions as potential markers of the recent-onset mental illness severity.

Methods: A total of 50 participants (men: N=26, 52%; women: N=24, 48%), aged 18–40 (M=26.2, SD=5.8) with recent-onset mental illness completed standard, well-established assessments of illness severity, cognitive biases and failures, neurocognitive status, participation in daily life, and sensory responsiveness thorough cross-sectional design. The differences between the groups of the illness severity were explored with descriptive statistics, followed by a Kruskal–Wallis test. Discriminant analysis was used suggesting a multi-varied model for the separation between the groups of illness severity.

Results: Three groups of illness severity exhibited differences in premorbid cognitive functions (F(2)=5.8, p<.01) and participation diversity (F(2)=3.8, p<.05). Combining these two indices explained 92% of the variance between the groups (Wilks' Λ = .68, $\chi2(4)$ = 17.7, p=.001), accurately classifying mild to marked illness severity (62.5–88.5%).

Conclusions: The study contributes to revealing factors involved in the formation of more severe mental illness and suggesting possible avenues for early intervention and prevention. Cognitive biases and sensory modulation dysfunction may contribute to the illness formation. Still, the most effective markers of more severe mental illness onset are functional cognition and limited participation diversity. Since addressing these markers is a unique specialization within occupational therapy, the findings highlight the potential contribution the profession can make to the early identification of the most vulnerable populations.

KEYWORDS

objective participation, subjective participation, cognitive failures, cognitive biases, sensory processing, serious mental illness, intensive care

1 Introduction

Mental illness onset can be a life-changing event for individuals and their loved ones, raising significant uncertainty about the future (1, 2). Indeed, it was demonstrated that mental illness affects well-being and general health indices, disrupts autonomy, choice, and feeling of being in control, interrupts a positive self-image and a sense of belonging, intervenes with engagement in meaningful and enjoyable activities, and challenges the experiences of hope and optimism (3). The illness severity at early stages is as important as being a predictor of future illness trajectory and general health outcomes (4–7). Interventions for those who are at risk of developing more severe illness have the potential to eliminate the long-term burden of mental health conditions (1, 2). Thus, identifying markers for the development of more severe illness can inform both preventive strategies and early interventions, which should be tailored to individual needs (1, 2). Moreover, such understanding could bridge the gap between models predicting illness onset (2) and those explaining long-term outcomes of mental illness (4, 8).

While there is extensive research on illness onset (2, 5) and prolonged mental illness severity (9, 10), models for explaining illness severity in recent-onset are scarcely studied. The staging approach suggests a vision of mental illness as a continuum with shared neurobiological and psychosocial underlying mechanisms through illness formation, onset, progression, and persistence (5). Thus, some similarities may be assumed between markers for the transition to illness, and illness severity at different stages. Moreover, recent illness onset is a particular challenge, since it is frequently characterized by shared signs and symptoms through various diagnoses (e.g., psychosis, depression, anxiety, etc.), multiple changes in symptom presentations, and switches between given diagnoses over time (5, 11). Thus, a transdiagnostic approach that distills similarity in neurobiological, genetic, and psycho-social processes underlying mental illness across the boundaries of diagnoses is of relevance (5, 12, 13).

In the context of the transition into mental illness, it was demonstrated that genetic factors, previous level of functioning, neurocognitive deficits, and aberrant thinking patterns (2, 5, 6, 14–16), as well as personal factors such as age, gender, years of education, history of trauma, and substance use (2, 5) may serve as precursors of a range of mental health disorders. The prediction of long-term outcomes from the illness onset was found to be based on premorbid employment status and educational level (6, 14), general functional status at baseline (6, 14, 17), cognitive level (6, 8, 17), social support, adverse life events, illness duration, duration of untreated psychosis, treatment adherence, hospitalization, and demographic factors (8–10, 14). Thus, to make an initial step toward model building, this pilot study was designed to investigate shared factors between the illness stages as possible markers of recent-onset illness severity. The study also innovatively suggests additional markers based on the theoretical background of occupational therapy regarding factors promoting health (18), as well as general, intradisciplinary models of health, disability and functioning (19).

1.1 Cognition

Neurocognitive deficits which include processing speed, attention, learning and memory, problem-solving, and working memory are hallmarks of prolonged mental illness (3, 7). These have been reported before the illness onset, in early childhood (15, 20), and serve as a precursor of mental illness onset (6, 8, 15, 17). Being independent of illness symptoms, neurocognitive deficits have been suggested to be involved in illness formation and persistence.

An additional construct of interest in the field of mental illness is the non-functional thinking patterns——cognitive biases. Being distinct from neurocognitive functioning (16, 21), aberrant thinking patterns about the world and events include anomalous perception with attribution and over-interpretation of events as threatening, catastrophic, and dichotomous thinking, jumping to conclusions, and emotionally-based reasoning (22). These thinking patterns elicit inaccurate judgment and unusual insights into the reality underlying some mental illness signs (16, 21, 23). The cognitive biases can also manifest within the context of social situations. Attribution biases refer to idiosyncratic patterns of comprehension and interpretation of social events and interactions (e.g., blaming others for negative occurrences). These biases were found to be one of the core domains of social cognition and impaired in schizophrenia (24). With their developmental trajectory (22), aberrant thinking patterns were reported in individuals with resent-onset psychosis (16, 23), but also a core element in major depression and anxiety (25). However, the literature in the field of early illness onset is inconclusive; for example, no differences were found between individuals with early psychosis and healthy controls in the attribution biases within social context (26).

1.2 Sensory modulation

Recent literature suggests that alterations in sensory modulation play a significant role in mental illness (12). Sensory modulation is a process in which the brain interprets sensory information of all modalities to produce context-appropriate behavioral and emotional responses meeting individual needs (27–29). Interference in sensory modulation——sensory modulation dysfunction (SMD)——has been found with a prevalence of 5–18% in the general population, escalating 2–4 times in schizophrenia, affective disorders, and anxiety (27, 28). Different types of SMD were detected representing typical patterns of association between an altered interpretation of sensory input and following, idiosyncratic behavioral and emotional responses, mainly maladaptive and disproportional (27–29). Originally guided by behavioral representation, the assumption of alterations in sensory processing received support from electrophysiological and imaging studies in various mental health conditions (30). It was demonstrated that in otherwise healthy young adults, SMD substantially affects an individual's life, psychological well-being, and everyday functioning (31).

1.3 Participation in daily life occupations

Most research has investigated objective aspects of general functioning in everyday life in recent-onset and prolonged illness (7, 8, 14, 32, 33) or has been specific to employment and education status (6, 14). The World Health Organization (19) put everyday functioning in a broader concept of participation——an involvement in life situations, emphasizing the need to address a range of everyday life occupations (19). Focused literature on participation further expands the concept, arguing for its complex nature encompassing objective dimensions of attendance at activities (aspects of everyday functioning) but also subjective dimensions of the experience of involvement (34). Indeed, it was found that subjective dimensions of participation, which were mostly omitted in the research to date, are of particular importance to well-being in mental health (35). Moreover, most studies have focused on objective measures of functioning at baseline or after the onset of mental illness (8, 14, 32, 33), limiting our ability to investigate the predictive quality of everyday functioning alterations for understanding the trajectory of mental illness.

1.4 Rationale and study aim

Mental illness may have a pronounced impact on the person and the whole community life, while serious mental illness substantially interferes with one or more major life activities, such as work, home management, and social relationships (4, 8). Identifying early signs of illness severity is crucial for tailoring prevention and intervention strategies, aiming to mitigate the enduring impact of mental illness. Thus, this study was designed to investigate the feasibility of building an explanatory model of the recent-onset illness severity, addressing a range of premorbid potential precursors. Even though there is an ongoing debate on how to conceptualize illness severity (e.g., number of symptoms, their frequency, persistence, functional disability, or quality of life) (36), for this study it was operationalized through general psychiatric symptomology. Specifically, we investigated premorbid objective and subjective dimensions of participation in daily life occupations, sensory processing, and cognitive functions as markers of the recent-onset mental illness severity. Relying on previous knowledge in the field of mental health, this study is grounded on the International Classification of Functioning, Disability, and Health (ICF) model (19) and occupational therapy models (18). This study was designed to provide insights into the onset of mental illness by addressing symptom severity through an occupational therapy perspective. This perspective posits that engagement in occupations is a crucial component of health with a mutual bi-directional relationship, and, it is a result of a dynamic interplay between personal factors, occupations, and the environment (18). Additionally, the study incorporates tools developed within occupational therapy to reflect its unique areas of concern and expertise, addressing both the objective and subjective dimensions of participation across broad areas of occupation and sensory modulation. Recent onset illness severity is important for future illness trajectory, including general health outcomes, well-being, and daily life participation (4–7). The recent onset of mental illness is a sensitive situation that requires careful consideration to determine the appropriate treatment intensity. Inadequate treatment may fail to meet the individual's needs, potentially leading to the development of a chronic condition. Conversely, overly intense treatment may discourage individuals who may already be ambivalent about mental health interventions and exceed the resources of the health service. Identifying a population at risk can facilitate targeting those who need of more intense intervention, including, for example, occupational therapy intervention. Thus, the aim of this pilot study was to investigate premorbid objective and subjective dimensions of participation in daily life occupations, as well as sensory and cognitive functions as potential markers of the recent-onset mental illness severity. The results of the study may help to distill the role of the occupational therapy within mental health workforce acting for prevention and early intervention. These by revealing the contribution of information on participation patterns and sensory modulation——areas of professional proficiency——to the early detection of the most vulnerable population with recent mental illness onset. Understanding factors enabling early identification may expand the knowledge on the mechanisms of illness formation thereby offering possible avenues for prevention and early intervention with this population.

2 Methods

2.1 Study design

This cross-sectional study involved people with recent-onset psychiatric illness who were recruited through convenience sampling.

2.2 Participants

Fifty participants (men: N=26, 52%; women: N=24, 48%), aged 18–40 (M=26.2, SD=5.8) with recent-onset mental illness were recruited from intensive services of two regional mental health centers (differing geographically). For this study, recent-onset was defined as a first-time formal diagnosis of any psychiatric disorder illness based on the ICD-10 criteria. The diagnosis was validated at discharge. The participants were admitted either to secured wards (N=23, 46%), open wards (N=13, 25%), or intensive day-care programs (N=14, 26.9%), received stable medication for at least two weeks at recruitment and were admitted for less than 12 weeks (inclusion criteria). The median duration of the treatment in days was 29 (IQR: 18–52). Individuals who had previous contact with psychiatric services (except for contact in the last six months which did not lead to a diagnosis), and had a history of previous use of psychiatric medication and substance use disorder were excluded from the study. In addition, people with neurological and physical health conditions that limit participation in daily occupations and cognitive functioning were excluded from the study.

Diagnoses included psychotic spectrum disorders (N=25, 50%), affective disorders (N=19, 38%), anxiety disorders (N=3, 6%), and personality disorder (N=3, 6%). The participants had an average of 12.4 years of education (range 8–16, SD=1.8), were mostly unemployed, and lived in urban areas (Table 1).

Sample size calculation was based on the study of Torgalsbøen et al. (16). using an association between neurocognitive general status at baseline in the first episode of schizophrenia and general functioning at 6 months as an indicator of illness outcomes. Based on the reported correlation coefficients $0.3<r<0.5$, the minimal number of participants in the study was defined as N=26 with $\alpha = 0.05$ and a power of 0.85 (G*Power software). Since the current study was intended to address a range of diagnosis and explanatory factors, we doubled the sample size (N=50).

2.3 Measurements

To meet the study aims, we measured illness severity, premorbid cognitive functioning, thinking patterns, sensory modulation, objective and subjective dimensions of participation in a range of daily-life occupations, and current neurocognitive status.

2.3.1 Illness severity

Clinical Global Impression (CGI) (37) is a commonly used tool for evaluating mental illness severity based on clinician reports. The illness severity sub-scale (CGI-S) is rated on a 7-point scale ranging from 1 (“normal, not at all ill”) to 7 (“among the most extremely ill patients”), based on clinical judgment and experience with the same psychiatric conditions. The CGI-S was found to be sensitive to many diagnoses (38). Its validity was demonstrated compared to well-established psychiatric tools such as Brief Psychiatric Rating Scale ($0.41<r<0.74$), Positive and Negative Syndrome Scale ($0.54<r<0.68$), and Hamilton Rating Scale for Depression ($0.79<r<0.86$). In addition, inter-rater reliability ($r = 0.66$) was reported (39).

2.3.2 Sensory modulation

Sensory Responsiveness Questionnaire- Intensity Scale (SRQ-IS) (29) was used to evaluate sensory modulation patterns as a trait. This self-report questionnaire addresses the intensity of responses to daily life non-painful sensations based on predefined daily life scenarios. The measure consists of 58 statements, involving each sensory stimulus in one of the following modalities: auditory, visual, gustatory, olfactory, vestibular, and somatosensory stimuli excluding pain. The items are worded in a manner attributing a hedonic or aversive response to the sensory scenario. The participants are required to rate the intensity of the response to the stimulus described on a Likert scale ranging from 1 (“not at all”) to 5 (“very much”). The SRQ intensity scale elicits two scores: SRQ-Aversive (32 items) and SRQ-Hedonic (26 items) (29). Scores are calculated as means in each scale. Identifying SMD via one or both scales is based on normative data cut-off scores, indicating sensory over-responsiveness (SOR) or sensory under-responsiveness (SUR) (40). The SRQ has been demonstrated to have content, discriminant, criterion, and construct validity, as well as internal consistency (Cronbach α= 0.90–0.93) and test-retest reliability (r= 0.71–0.84; $P < 0.001$–0.005) (29).

2.3.3 Cognitive functioning

Montreal Cognitive Assessment (MoCA) (41) was used to evaluate current neurocognitive status. The MoCA is a brief screening tool, widely used in research and clinics, aimed to assess mild cognitive impairment based on the following cognitive functions: executive functions, visuospatial abilities, short-term memory, language, attention, concentration, and working memory; and temporal and spatial orientation. A maximum score of 30 points indicates intact neurocognitive functioning (41). The test has high test-retest reliability ($r = 0.92$, $p<0.001$), internal consistency (Cronbach alpha=0.83), and criterion validity, which was established in comparison to MMSE ($r=0.87$, $p<0.001$) (41).

Cognitive Failure Questionnaire (CFQ) (42) and Cognitive Biases Questionnaire (CBQ) (22) were used to investigate premorbid cognitive functions. The CFQ is a self-report questionnaire that consists of 25 items that address cognitive errors or lapses in perception, attention, memory, and motor action through everyday life activities. The responder is asked to rate the frequency of occurrence using a 5-point Likert scale (0 –

Never, 4 – Very often). The highest score (100 points) represents the lowest occurrence of cognitive failures. Given the type of activities covered by the CFQ, which reflect prolonged situations in an individual's everyday life (e.g., forgetting medical appointments and leaving important letters unattended for days), we used this measure as an index of premorbid cognitive functioning in daily life (43). The CFQ has sufficient test-retest reliability (0.80<r<0.82), internal consistency (Cronbach's alpha = 0.91), and construct validity (44). The CBQ is a self-report questionnaire aimed to identify five types of thinking distortions: Jumping to Conclusions (JTC), Attribution, Dichotomous Thinking, Catastrophizing, and Emotionally Based Reasoning (22). The questionnaire consists of 30 statements that describe everyday situations, equally divided into two themes: Anomalous Perception (AP) and Threatening Events (TE). The participant is asked to imagine him/herself in each situation and choose the option that best describes his/her patterns of thinking about the situation. The scoring ranges from 1 (absence of bias) to 3 (likely presence of bias). The CBQ has test-retest reliability (r=0.96), internal consistency (Cronbach's alpha = 0.89), and construct validity based on comparison with the Cognitive Style Test (0.77–0.85) (22).

2.3.4 Participation patterns

Adult Subjective Assessment of Participation (ASAP) (45) is a self-report questionnaire aimed to evaluate participation patterns in everyday life activities by the following dimensions: diversity, intensity, satisfaction, enjoyment, with whom the occupations occur and where. The questionnaire addressed 52 activities, organized into 9 categories. In this study, we collected data on the objective participation dimensions of the participation diversity and intensity, as well as the subjective participation dimension of enjoyment. The data on these participation dimensions was collected as follows: the participation diversity was measured by the number of activities participated in, the intensity was calculated based on the reported frequency of actual participation in activities (7-point scale: 1 – once time within the period; 7 – several times a day; and 2 additional ratings for (a) activities that have not done before and not doing currently, and (b) activities that have done in the past, but not doing currently), and enjoyment——rating of the subjective experience on a 6-point Likert scale (0 – did not enjoy, 5 – enjoy very much). The participants were asked to report on the participation during 4 consequent routine months in 5 target occupation categories: domestic life, recreational activities, entertainment, educational activities, leisure and sports activities, and quiet recreation. Test-retest reliability ranges from 0.553–1 for different categories. Exploratory factor analysis approved a factor solution indicating sufficient construct validity. In addition, the ASAP was found to discriminate between groups of individuals with different types of health conditions and the control group (45).

2.4 Procedures

The Institutional Review Board of two regional mental health centers approved the study (0042-15-GEH and 102-16/4-14). The research team which consists of 2 occupational therapists approached individuals who met the inclusion and exclusion criteria. Those who agreed to participate in the study and provided written informed consent to participate following an explanation of the study's aims and procedures were enrolled. The study procedures lasted 90 minutes, which could be divided into two shorter sessions over three days, according to the participants' will. The participants completed a demographic questionnaire first, followed by questionnaires in a counterbalanced order: the SRQ, ASAP, CBQ, and CFQ. Finally, the MoCA test was administered. The CGI was completed by the research team (two occupational therapists) concurrently with the administration of the other instruments. The team conducted a session to establish inter-rater reliability, during which they rated five subjects and achieved an agreement level of 90%".

The research team of 2 occupational therapists approached individuals who met the inclusion and exclusion criteria. The CGI was completed by the research team who were previously trained for its completion and conducted session.

2.5 Data analysis

Descriptive statistics was used to characterize the study participants for their demographic data and the study variables. Based on the SRQ scores, the study participants were classified as having SMD of hedonic type, SMD of aversive type, and non-SMD.

The data distribution was explored with the Shapiro–Wilks test, indicating normal distribution for all the measurements except for the CBQ total score. The Pearson correlation coefficient was used to investigate the association between the variables. Differences between the groups of the illness severity in demographic data and CBQ total score were explored with the Kruskal–Wallis test due to the type of data distribution. Other between-group differences were analyzed with one-way ANOVA. In addition, the effect size metric (η^2) was calculated for all comparisons. Discriminant analysis, a multivariate statistical technique, was used to investigate the best combination of independent variables explaining the separation between the groups of illness severity. The separation is measured by the distance between the means of the groups and their variance. The accuracy of the best-fit discriminant function is represented through various statistic parameters including classification rates. Such a function may be used as a model for predicting the group membership of a new observation (46). We applied discriminant analysis with a stepwise method to build the model. The independent variables for the discriminant model were selected based on the results of the foregoing analyses. The data was analyzed using SPSS-28 (IBM) and the level of statistical significance was set at.05.

3 Results

3.1 Illness Severity and associated factors

The illness severity, as measured with CGI-S, varied among the study participants from minor mental illness (N=16, 32%), mild

TABLE 1 Demographic and illness-related data by illness severity groups (N=50).

	Minor (N=16)	Mild (N=26)	Moderate and marked (N=8)	Between-groups differences	
Gender					
Man	7 (43.8%)	17 (65.4%)	2 (25%)	χ^2 (2)=4.64	
Woman	9 (56.3%)	9 (34.6%)	6 (75%)		
Place of living					
Urban	15 (93.8%)	23 (88.5%)	6 (75%)	χ^2 (2)=5.47	
Not-urban	1 (6.2%)	3 (11.5%)	2 (25%)		
Job in past 6 months					
Yes	6 (37.5%)	13 (50%)	2 (25%)	χ^2 (2)=1.77	
No	10 (62.5%)	13 (50%)	6 (75%)		
Diagnosis at discharge					
Psychotic disorders	6 (37.5%)	15 (57.7%)	4 (50%)	χ^2 (6)=5.3	
Affective disorders	9 (56.3%)	7 (26.9%)	3 (37.5%)		
Anxiety	0	2 (7.7%)	1 (12.5%)		
Personality disorders	1 (6.3%)	2 (7.7%)	0		
Type of service					
Day treatment	5 (31.3%)	7 (26.9%)	2 (25%)	χ^2 (4)=5.76	
Open ward	1 (6.3%)	10 (38.5%)	2 (25.5%)		
Close ward	10 (62.5%)	9 (34.6%)	4 (50%)		
	Median (Range)	**Median (Range)**	**Median (Range)**	**Statistics**	**ES**
Age	26 (21.5–30)	26.5 (22.75–30.25)	22 (20–27.75)	H (2)=2.1	.05
Education (years)	12 (11.25–14.75)	12 (12–13.25)	12 (12–12.75)	H (2)=0.02	0
In-patient staying duration (days)	21 (16–36.5)	34.5 (20.5–55.25)	27 (24–54.5)	H (2)=3	.05

illness (N=26, 52%), moderate illness (N=7, 14%) up to marked illness (N=1, 2%) with Median= 3 (IQR: 2–3).

The correlational analysis indicates an association between the level of psychiatric illness and diversity of participation (r=-0.33, p<.05). The higher the level of symptomology after illness onset the lower the diversity of participation that preceded the illness onset. In addition, we found a correlation between illness severity and specific cognitive biases due to anomalous thinking (r=0.38, p<.01) and emotional reasoning (r=0.288, p<.05), even though no association was found with the total CBQ score (r=0.11, p>.05). Higher scores of specific cognitive biases were associated with a higher level of symptomology. No correlation was found with additional demographic factors, participation dimensions, MoCA score, cognitive failures, and sensory modulation indices (-0.15<r<0.24, p>.05).

For an in-depth investigation of illness severity, we combined participants with moderate and marked illness severity into one group. No differences were found between the three groups of illness severity (minor, mild, and moderate and marked) in demographic and illness-related variables (Table 1). However, the groups differed in the premorbid cognitive functioning as measured by the CFQ and in the diversity of participation (Table 2). *Post hoc* analysis revealed differences in CFQ scores between the mild and moderate/marked illness groups while the source of the difference in the participation score is a discrepancy between the moderate/marked illness group and each one of the two other groups. No differences were found in current cognitive status, cognitive biases, or participation frequency and enjoyment (Table 2). In addition, no statistically significant difference was found between the three illness severity groups in the sensory modulation type distribution (SMD versus non-SMD: $\chi^2(2)=5.46$, p=.065; SMD by types: $\chi^2(4)=5.9$, p=.21) (Figure 1). Of note, based on the ES metrics, the trend for the difference was demonstrated in the premorbid cognitive biases of dichotomous thinking and emotional-based reasoning, as well as in premorbid hedonic and aversive sensory patterns (Table 2).

The analysis of differences by areas of occupations before illness onset revealed similar patterns of participation between the groups by the illness severity (0.1<H(2)<4.2, p>.05), except for diversity of recreation and leisure activities (F(2,47)=3.8, p<.05). The results stem from the difference between both groups of milder illness severity, where participation diversity was higher, and the group of moderate and marked severity, according with *post-hoc* analysis (Figure 2). ES

TABLE 2 Participation, cognition, and sensory modulation indices by illness severity groups (N=50).

	Minor (N=16)	Mild (N=26)	Moderate and marked (N=8)	Between-groups analysis		
	Median (Range)/ M(SD)	Median (Range)/ M(SD)	Median (Range)/ M(SD)	Statistics	p.value	Effect Size
Cognitive measurements						
MOCA	25.5 (3.6)	24.9 (3.9)	23.7 (3.9)	F (2)=0.5	.62	.02
CFQ	48.7 (18)	39.5 (13.9)	60.25 (16.1)	F (2)=5.8**	.006	.2
CBQ						
Total Score	40 (37–44)	43 (39–47)	48 (39–55)	H (2)=3.2	.51	.03
Threatening events	23.3 (6.3)	22.6 (4.5)	25.6 (6.9)	F (2)=0.8	.46	.04
Anomalous perception	19.9 (4.2)	20.4 (3.4)	21.6 (2.4)	F (2)=0.5	.6	.02
Attribution	8.1 (1.5)	8.1 (1.45)	7.4 (0.8)	F (2)=0.7	.51	.03
Catastroph.	8.7 (2.4)	8.4 (1.7)	9 (1.6)	F (2)=0.3	.73	.01
Dichotomous thinking	8.1 (2.2)	7.9 (2)	10.1 (1.95)	F (2)=3.1	0.055	.12
Jumping to conclusions	10 (3)	9.8 (2.5)	10 (2.5)	F (2)=0.02	0.99	.00
Emotionally based reasoning	8.3 (2.7)	8.6 (1.8)	10.6 (2.8)	F (2)=2.5	.095	.09
Sensory modulation aspects – SRQ						
SRQ- Aversive	2.3 (0.46)	2 (0.47)	2.4 (0.73)	F (2)=1.9	.19	.08
SRQ- Hedonic	2.3 (0.54)	2.2 (0.54)	2.7(.74)	F (2)=2.3	.062	.1
Participation dimensions – ASAP						
Diversity	19.7 (8.8)	18.9 (8.7)	9.9 (9)	F (2)=3.8*	.029	.14
Intensity	3.4 (1.2)	3.2 (1.65)	2.8 (2.5)	F (2)=0.4	.7	.02
Enjoyment	4.5 (0.64)	4.7 (0.8)	4.8 (1.4)	F (2)=0.56	.57	.03

*p<.05; **p<.01; ASAP, Adults Subjective Assessment of Participation; CBQ, Cognitive Bias Questionnaire; CFQ, Cognitive Failure Questionnaire; MOCA, Montreal Cognitive Assessment; SRQ, Sensory Responsiveness Questionnaire.

metrics suggest possibility for a similar trend of lower participation diversity in domestic life activities, learning and applying knowledge activities, and quite leisure activities among participants with moderate and marked severity ($0.8< \eta^2<1$). In addition, effect size metrics suggest a trend for difference in several areas where the activities were stopped, i.e., quiet leisure and learning and applying knowledge ($0.5< \eta^2<0.8$), and enjoyment in these areas ($0.6< \eta^2<0.8$) (Figure 2), while those with minor illness tend to report experiencing lower enjoyment and more terminated activities.

Secondary analysis, comparing the two main types of diagnosis: psychotic spectrum disorders (N=26, 50%) and affective disorders (N=14, 26.9%). We found statistically significant differences in SRQ aversive score (U=75, p<.01) and CFQ score (U=91, p<.05) solely. Specifically, individuals with affective disorders reported higher

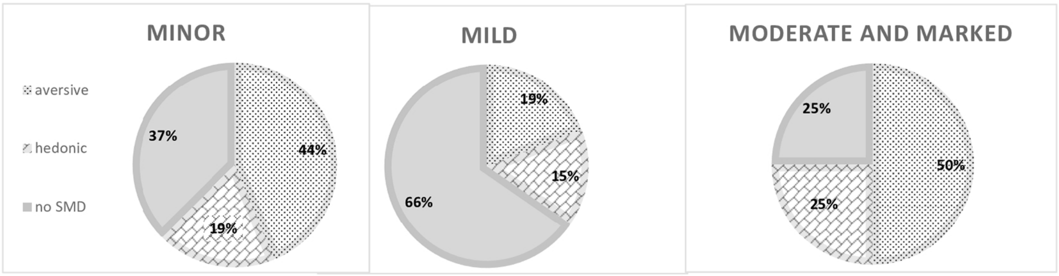

FIGURE 1
Sensory modulation pattern distribution in the minor, mild, and moderate, and marked illness groups. SMD, sensory modulation dysfunction.

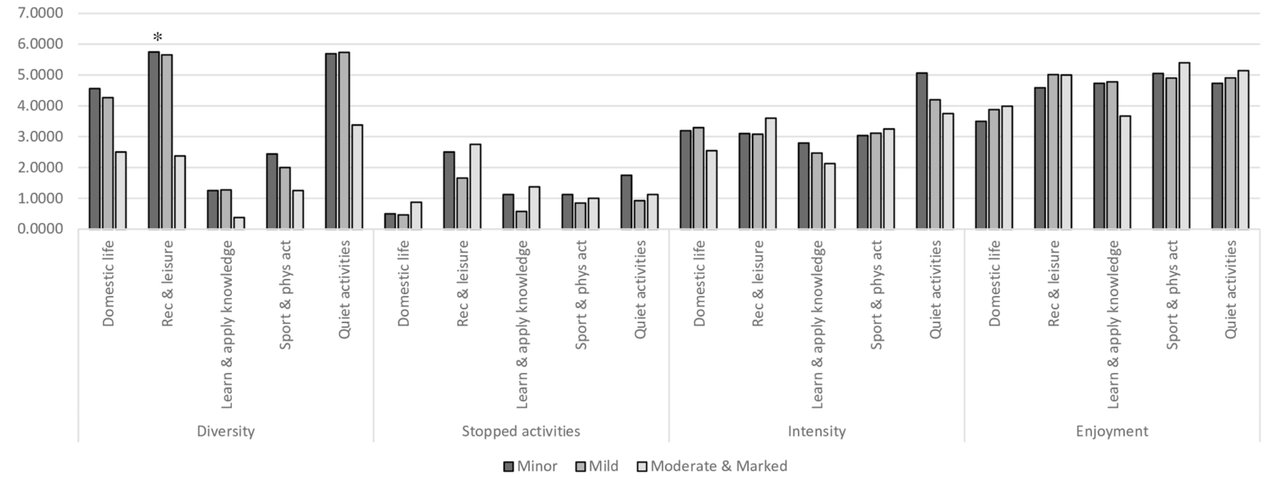

FIGURE 2
Participation dimensions by areas of occupations in study groups (the ASAP score) (N=50). ASAP, Adults Subjective Assessment of Participation; *p<.05.

scores on the SRQ-Aversive scale (Psychotic spectrum: Median=1.9, IQR: 1.7–2.1; affective disorders: Median=2.4, IQR: 2.1–2.9) and higher frequency of cognitive failures (Psychotic spectrum: Median=40.5, IQR: 31.3–43.8; affective disorders: Median=47.5, IQR: 36–62.8).

3.2 Illness severity — explanatory multivariate analysis

A two-step discriminant analysis was performed using two independent variables that showed statistically significant differences between illness severity groups: cognitive failures (CFQ) and participation diversity. Additionally, the SRQ hedonic score was included in the regression model due to its high effect size for the group differences, even though it was not statistically significant. The first step includes CFQ (Wilks' Λ = .8, *p*=.006) and the second step includes, in addition, the participation diversity (Wilks' Λ = .68, *p*=.001). The final discriminant function within two measurements (CFQ and participation diversity) was significant (Wilks' Λ = .68, $\chi^2(4) = 17.7$, *p*=.001) explaining 92% of the variance of the latent variables within a discriminant function (canonical correlation is 0.55). In contrast, the additional discriminant function with SRQ score explained the rest of the variance (8%, canonical correlation=0.19) and was not found to be statistically significant, as could be expected (Wilks' Λ = .96, $\chi^2(2) = 1.66$, *p*>.05). The best fit discriminant function has the largest relationship with CFQ (standardized coefficient of.83), followed by participation diversity ((standardized coefficient of.67). Increase of 0.05 in cognitive failures and decrease of 0.08 in participation diversity increase together the probability to have a more severe illness symptoms. The discriminant function was found to classify correctly 88.5% of mild illness, 62.5% of moderate and marked illness severity, and only 6.7% of minimal illness with a general rate of correct classification of 59.2%.

4 Discussion

The severity of recent-onset mental health condition is a precursor of future illness course (4–7) and guides the clinical practice directed to ameliorate the long-term consequences of mental illness (1, 2). This study has addressed the general level of psychiatric symptomology to meet unique characteristics of recent illness onset. Being grounded in the staging and transdiagnostic approaches, the study focused on investigating the severity of recent-onset illness precursors aiming to address the challenge of early detection. This pilot study suggests a model to explain recent-onset illness severity across three levels: minor, mild, and moderate, and marked. However, it should be noted that this model is more sensitive to detecting more severe illness and may not effectively indicate minor illness. The extent of self-report on cognitive failures in everyday activities and limitations in the diversity of participation in daily life before the illness onset were found to be indicators of severity of recent-onset illness.

4.1 Cognition

Our findings add to the existing literature, demonstrating that the extent of premorbid cognitive impairments, as reported by the participants, is indicative of illness severity at an early stage. The report on cognitive errors or lapses in daily life situations, as measured with the CFQ, was sensitive for detecting the severity of illness. The representation of cognitive skills in daily life situations as reflected by the CFQ, aligns with the concept of functional cognition (47). Functional cognition has been indicated as an important target for measurement and health care, given its importance for positive health outcomes and everyday life in a range of populations (47); and it is one of the core targets for the evaluation and intervention by occupational therapists (47). Previous research on functional cognition in mental health has addressed mainly populations with prolonged mental illness, demonstrating its contribution to health status and functional outcomes (e.g., 48, 49). This study contributes to existing knowledge by demonstrating the importance of functional cognition for health as early as the initial phases of mental health conditions' development. The findings further support the staging approach and underscores the relevance of occupational therapy theories and practices in this context. Within the recent onset of mental illness, the sensitivity of self-report on premorbid functional cognition to future illness severity can be further understood based on previous research on (1) the high prevalence of neurocognitive deficit among individuals at risk for the development of mental illness (15, 20), and (2) longer-term functional implications of neurocognitive impairments at onset (8).

Report on specific cognitive biases of "anomalous thinking" and "emotional reasoning" correlated with the illness severity index. The findings on the association of thinking patterns with illness severity are in line with the previous literature (16). Indeed, not-typical thinking patterns about the world and events has the potential to contribute to the symptoms' formation in a range of mental health conditions (16, 21, 23, 25). Still, the Cognitive Biases Questionnaire was not specific enough to properly distinguish between the levels of severity. This suggests either a limited sensitivity of the tool or the possibility that the cognitive biases, as reported by the participants, are a general faculty in mental health conditions, rather than a specific attribute of some level of severity. In addition, the contradiction in the literature may stem from the timing of evaluation of cognitive biases across the studies: before the illness onset and formal diagnosis or after it; or, which type of cognitive bias was addressed: those occurring here and now versus premorbid patterns.

Additional findings highlight the importance of considering the timeline of evaluation. We found that current neurocognitive status was less indicative of the illness severity than premorbid neurocognitive functioning in daily life activities. Given that the modeling of the severity of recent illness onset is in its infancy, we suggest that this finding reveals the unique stage characteristics. First, a performance-based measure of neurocognitive status in the sub-acute stage, as was done in the current study, may still be less representative of the actual decline in cognition being blurred by the general context of coping with recent-onset mental illness. On the other hand, the self-report grounded on specific daily life occurrences may be a reliable source for gathering information on objective phenomena. Still, little congruency with findings on the role of the neurocognitive current status in the explanation of prolonged illness severity and emerging illness onset (7, 8, 15, 20) may stem from the research procedures. While most previous studies used comprehensive batteries with the potential to capture nuanced fluctuations in cognitive functions, this study involves a screening neurocognitive test only. In addition, the studies in prolonged illness addressed disability level, including independent living, employment status, or quality of life as an outcome measure (7, 36), rather than a general estimation of illness severity as was done in the present study.

4.2 Sensory modulation

To the best of our knowledge, this study was the first to investigate sensory modulation alterations in the context of recent-onset mental illness severity. Following previous studies with serious mental illness (27, 28), we found high rates of SMD in the population with recent illness onset, based on their self-report. Indeed, altered sensory modulation suggests living continuously with an aversive experience evoked by everyday typical, non-painful sensations or omitting important internal (body) signs and external (environment) information (31). Living with sensory alterations can lead to misinterpretations of reality. Consequently, individuals' reactions to situations might be inappropriate according to social standards, which often fail to account for the invisible challenges of SMD. Alternatively, reactions may be socially acceptable but require individuals to endure discomfort. Both scenarios have a potential to be distressing and resource-intensive (27, 28). Indeed, it has been suggested that SMD may interfere with a coherent sense of self (50) and contribute to the formation of mental illness with symptoms of anxiety, avoidance, mood alteration, and even psychosis and dissociation (27, 28, 30, 50). The impact of SMD may be even more prominent given its involvement in additional processes, such as cognitive impairments. Proper cognitive processing requires intact input (51). In this light, SMD may contribute to cognitive failures and biases, such as the interpretation of events as threatening, as well as provoke catastrophic, attributional, and dichotomous thinking, interrupt reasoning and conclusion-making, and generally alter cognitive basic functions of attention (31, 52). Surprisingly, in this current study, self-report on SMD was not statistically distinctive within any of the illness severity groups neither in prevalence nor in specific type, even though effect size metrics suggested group difference trends. These findings imply that regardless of the mental illness severity level, SMD is a general attribute across mental health diagnoses. However, a prospective study that monitors sensory regulation processes throughout developmental stages until the onset of mental health conditions is required to deepen our understanding of the impact of SMD on the severity of recent illness onset.

4.3 Participation patterns

This study contributes to the existing literature by investigating participation in a range of areas of occupation through various activities by both objective and subjective dimensions before the mental illness onset based on self-report. Our findings expand previous reports on the contribution of premorbid employment, educational status, and general functional status to future illness trajectory (6, 14, 17). We demonstrated that lower participation diversity in a range of occupations including domestic life activities, learning and applying knowledge, and the scope of leisure activities, which precede the illness onset according with the participants report, is a reliable indicator of more severe illness. These findings further validate the importance of participation in occupations and activities for health and well-being (8, 9, 14, 33).

The particular difference between the groups of illness severity was found in recreation and leisure activities including, wandering around the home for leisure, visiting cultural and sports events, visiting family and friends, hosting, going out to dine, day trips, or overnight vacation. The findings are of importance since all these activities were recognized by individuals with mental illness in previous research as crucial for health, and they are in general under-attained (32, 33). The vulnerability of these activities to mental state fluctuations stems from their nature. These activities are non-obligatory and self-guided, requiring intrinsic motivation, self-organization, planning, and additional efforts to pursue, all these capacities were found to be affected by prolonged mental illness (3), at the onset of mental illness (8, 17), but also altered before the illness onset, as it was reported in the current study. Being indicative of mental health deterioration, recreation, and leisure activities have no recognized standards, posing difficulty in the detection of decline.

The findings of this pilot study suggest that additional differences between the groups in various participation indices may emerge in future research. This is evidenced by large effect size (53–55) in between-group differences in domestic life activities, learning and applying knowledge activities, and quiet leisure activities with the trend to be inferior in moderate illness as early as in the period preceding illness onset. Of note, these differences did not reach statistical significance and should be considered with caution, even though they are analogous to differences in prolonged stages of mental illness (7). Interpretation of effect size metrics expands our understanding of the discriminant quality of the participation diversity. From a developmental perspective, the possibility for a reduction in participation diversity is of particular concern among young adults, given the importance of leisure activities, learning, and applying knowledge, as well as practicing domestic life activities for personal formation and successful transition into adult life (33). Initial indications of between-group differences were seen in the report on a number of terminated activities in areas of quiet leisure, learning, and knowledge application, as well as in the level of enjoyment derived from participation in these areas. While the trend of difference between the groups was discerned solely through effect size metrics and was inconclusive, it does offer some insights. It hints that individuals with more severe mental illness tend to stop less quiet leisure activities, but this specific type of activity was less enjoyable for them. In addition, they may tend to discontinue learning and applying knowledge activities, which were more enjoyable for them. These patterns of particular concern give importance to participation in activities with health-promoting experience (32, 33, 35) and a high risk of becoming a constant participation pattern of disengagement from health-supportive activities and transition to the prolonged stage of the illness (14, 56). Still, this study failed to demonstrate a clear contribution of the subjective participation dimension to the distinguishing between the groups of illness severity.

Interestingly, despite the general low intensity/frequency of participation that was reported, no differences were found between the groups in this index. The results may stem from the sample size in each group. Still, they may suggest that before the onset of mental illness of any severity, people can keep the frequency of engagement, possibly at the expense of diversity. Alternatively, activities in which they maintain the involvement, predefine the frequency, and, thus, support the participation despite the changes preceding the illness onset. These findings support arguing for a need for a nuanced approach to the analysis of objective and subjective indices by areas of occupations to avoid misinterpretation of the participation patterns, and, thus, misidentification of the severity of recent-onset mental illness.

The model, proposed by this study, was not sensitive to minimal illness severity. Most of the individuals indicated by the staff with minimal illness were classified by the model with either mild or moderate levels of the illness. Three variables were enrolled in the model representing three concepts: functional cognition, everyday participation, and sensory modulation. These constructs were selected based on the knowledge of prolonged mental illness and transition into the illness, and initial statistical analysis. It may be that there are specific nuances of minimal illness versus other types of severity at illness onset, which are not prominent within existing literature, and/or were not captured by this study. For example, social cognition which has extensive evidence (24), and environmental factors were not addressed in the study. In addition, it may be that some of the measures, that were managed in the study (e.g., neurocognitive status screening tool), were not sensitive enough to differentiate between the groups. The implication of these findings will be further addressed in the conclusions. Additional intriguing findings were that, in contrast with the previous research, demographic factors of level of education, employment status, area of living, and living situation, were not indicative of the illness severity underscoring the uniqueness of this illness stage albeit certain similarities. In addition, no difference in the study variables of cognitive functioning, participation, and sensory modulation was found between two groups of major psychiatric diagnoses: psychotic and affective further supporting the transdiagnostic approach. Still, there was no difference in the illness severity by diagnostic groups.

4.4 Implications for occupational therapy

This study reveals that alterations in objective and subjective participation dimensions and reduced functional cognition may be hallmarks for those who is going to develop more serious mental illness. The study highlights the most sensitive dimensions and areas of participation, emphasizing the need for comprehensive evaluation and in-depth analysis. A warning sign is a decline in participation diversity, coupled with the extent of given-up activities, rather than changes in participation intensity. Additionally, a decrease in the level of enjoyment with participation may serve as a warning indicator. The most sensitive area of occupation across various dimensions is leisure entertainment activities. Two other occupational areas of concern, where a restriction in participation should be noted, are domestic life activities and learning and applying knowledge. These findings suggest that occupational therapy can provide pivotal information for the early identification of the most vulnerable populations by assessing these factors using tools developed within the profession. Therefore, occupational therapy should be an integrated part of the relevant teams.

4.5 Study limitations

The findings should be considered in light of the study's limitations. The CGI was administrated by two clinicians from the research team. This method of administration enables standardization and reduces the risk of inter-rater variability, still it may be a source for biases within the rating due to limited knowledge of the participants and the potential impact of other tests' results on the judgement. These biases may obscure the associations between the measurements. The sensitivity of the model to indicate minimal illness severity was negligible. Even though it is less constraining for clinical practice, given the importance of detecting the most severe illness, further research addressing additional factors with in-depth measurements is needed. The sample size was relatively small regarding the number of investigated parameters. The considerable variability among participants has posed challenges in achieving statistically significant differences between groups, with some differences being discerned solely through effect size metrics seriously limiting the strength of the findings. The groups of both the illness severity and diagnosis were unequal for the number of participants. Together these affect the overall discriminant quality of the model, which was, as had been reported, significant, but relatively low, being less indicative of minimal illness severity. Next, we used screening cognitive measurements limiting to the general evaluation of the constructs. Some additional factors that have the potential to contribute to the illness severity were eliminated by the research procedures (e.g., substance use) or unaddressed (e.g., childhood trauma), limiting the possibility to capture their impact. In addition, due to the characteristics of the investigated population, the data on participation, sensory modulation, cognitive failures, and biases were collected retrospectively through self-report, thus, its quality might be affected by timing and mental illness onset, and, it may represent early state of the illness rather than premorbid situation. Moreover, premorbid cognitive functioning was evaluated based on self-report. Subjective reporting can reflect self-perception of cognitive function rather the functioning itself. It is recommended to conduct a prospective study assessing participation, sensory modulation, and cognitive functioning before the onset of mental illness using both self-reported and performance-based measurements, followed by tracking illness severity after onset. This will help confirm the predictive quality of the proposed model and further expand our understanding of relevant factors and their sensitivity.

4.6 Conclusion

Early detection of more severe illness may be helpful for early intervention and prevention to ameliorate the long-term impact of mental illness on the individual and the whole community. This pilot study focused innovatively on the investigation of markers for the severity of recent-onset mental illness and contributed evidence for building prediction models. The findings support the Transdiagnostic approach in recent onset, as well as the staging approach. The study provides further support for the extent of cognitive biases and sensory modulation dysfunction, as was indicated based on self-report, in populations with recent onset suggesting their contribution to the illness formation. Still, the explanatory quality of these factors for recent illness severity has not been proven. The same is true for most demographic and illness-related factors, including diagnosis, part of them were previously established as associated with illness onset or its severity in prolonging stages. The most effective markers were found to be the level of functional cognition and limited diversity of participation in daily life activities, as were reported by the participants. The findings on the importance of an in-depth assessment of functional cognition and participation for the identification of a vulnerable population, delineate the unique role of occupational therapy within forces acting to mitigate the impact of serious mental illness. Moreover, the study offers initial empirical support for potential avenues for preventive interventions by occupational therapy, supporting the relevance of existing professional practices in prolonged mental illness for recent-onset stage. Still, further research is needed to expand our understanding of mechanisms to indicate and eliminate severe mental illness onset.

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 Israeli Ministry of Health approved the study (0042-15-GEH and 102-16/4-14). The study was conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

LL-V: Writing – review & editing, Formal analysis, Conceptualization. AH: Writing – original draft, Methodology, Investigation, Data curation. MB: Writing – original draft, Investigation, Data curation. TB-S: Writing – review & editing, Methodology, Conceptualization.

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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

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Contributions of a time use perspective in community mental health practice: a scoping review

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Introduction: Time use is an important indicator of health and well-being. Exploration of time use can provide in-depth information about individuals' activity patterns including routines and structure, the experience of activities, personal priorities and challenges. People experiencing severe mental illness may be at particular risk for time use patterns associated with poor health and wellbeing.

Methods: This scoping review aimed to identify and map the evidence about how a time use perspective informs assessment and intervention in community mental health practice. Electronic databases and hand-searches were used to identify relevant studies involving people with severe mental illness, and focused on time use applications in practice. Twenty-nine studies were included in this review, data-extracted and synthesized with reference to the review question.

Results: Of the twenty-nine identified studies, seven described development and psychometric testing of time use assessments; twelve used time use tools to measure outcomes; and ten described or evaluated time use intervention approaches. The identified time use assessments typically involved retrospective diaries completed before or during structured interviews, and an Experience Sampling Method using smart technology to gather activity data in real time. Both psychosocial and occupational interventions used time use to measure outcomes relevant to activity engagement, social functioning, and personal recovery. The identified time use interventions originated in occupational therapy; included structured manuals and workbooks to enable reflection on daily time use; individual or group sessions to collaborate in identifying priorities, goal planning and supporting desired changes to activity patterns. These interventions were viewed favorably overall, with improved activity engagement, quality of life, and personal recovery reported.

Discussion: Time use assessments evaluate outcomes of importance to personal recovery and community inclusion. Time use interventions address activity patterns associated with poor health and wellbeing, using collaborative and supported activity engagement approaches, and contribute to emerging evidence on interventions that support personal recovery. Furthering peer involvement in developing and delivering these interventions will bring important insights to time use practice and research, while the social forces that marginalize or constrain activity participation for people with severe mental illness also need to be addressed to advance time use and other approaches that aim to support community inclusion.

KEYWORDS

time use, participation, recovery, occupational therapy, mental illness

1 Introduction and background

How people spend their time has long been recognized as an important indicator of health and well-being in various disciplines. Early in the 20th century, Adolf Meyer (1), a psychiatrist, espoused that the active and purposeful use of time had the potential for both restoring and maintaining health; and that the ways in which individuals used and organized their time reflect adjustments to daily living demands. Such principles informed the beginning development of the occupational therapy profession in the 1920s, and the conceptual roots of the recovery movement (2). Time use is of continuing interest in occupational therapy principally as a means to understand and address disrupted and restricted activity patterns that contribute to individuals' risk for ill-health (3). Further, as part of their public health strategies, many nations routinely collect time use data to better understand and influence the health and well-being of the general population (4). This emphasis on time use is grounded in the belief that various features of activities – such as frequency, meaning, repetition, duration, and variety – within a temporal context can either promote or compromise health. Public health applications of time use specifically target populations at risk for poor health and well-being due to problematic time use patterns with wide-ranging social impacts (4). As illustrative examples, these include adolescents' time use patterns associated with risk-taking, problem behaviors and mental health (5, 6); differences in time use among mothers and fathers (7); and health and well-being concerns emerging from time use patterns of unemployed youth, retirees and older adults such as a predominance of sedentary activity (8–12).

Ongoing health conditions, associated functional limitations and disability have also been linked to time use patterns that further contribute to poor health and wellbeing (13–16). For instance, a number of time use studies involving community dwelling people with severe mental illness have reported imbalanced activity patterns that show limited time spent in productive activities (such as work, parenting, education) and most time spent in sedentary or passive leisure activities (e.g. watching TV), self-care (e.g. eating and sleeping) and alone (17–20). Health and well-being concerns about such time use patterns include the limited variety of activities that individuals experience, reduced opportunities for community contributions and participation, weakened social connections and overall social marginalization (17).

Time use is an important way of conceptualizing and understanding engagement in activities and their impacts on health and wellbeing for people with severe mental illness. It provides insight into how people structure their time, their priorities, the social and spatial contexts of their lives and key barriers they face (21). Time use contributes to understanding how activity patterns are related to community inclusion and adjustment (17). Time use practice approaches offer a collaborative way to map day-to-day experiences, enabling individuals to reflect on the impacts of their daily activity experiences on their health and wellbeing (13, 22). Furthermore, opportunities to engage in personally and socially meaningful activities have consistently been identified by people living with severe mental illness as an important element of personal recovery, a process that differs individually but broadly involves creating a life of well-being and meaning with or without the continuing presence of illness (23–26). The potential of engagement in self-chosen activities to support personal recovery lies in their capacity to create conditions for building hope, meaning and purpose in life, developing social connections in communities of choice and ways of self-managing one's health in everyday life (27–29). As such, the extent to which time use focused approaches support people in their recovery should be considered an important outcome (3).

This paper focuses on time use as a practice approach for working with people with severe mental illness to construct self-chosen, meaningful and health-enhancing activity patterns and thereby to support recovery and wellbeing. To the best of our knowledge, the available evidence to guide time use focused practice approaches to these issues in mental health care has not previously been mapped or synthesized. A scoping review approach was considered appropriate for this purpose, given the authors' understanding that the evidence base in this area is diverse in both research methodologies and disciplinary context (30). The concept of time use has been used in public health and social sciences as an indicator of productivity, mental health, happiness and quality of life; and to understand the impact of disability at individual and population levels (4, 15). Describing the extent, range and content of the available evidence will provide a clearer basis for practices informed by a time use perspective, as well as rigorous guidance for ongoing practice developments and research directions.

1.1 Aims and objectives

The overall aim of this scoping study was to synthesize evidence on practice applications of a time use perspective to support the personal recovery of people with severe mental illness. The specific review question was: *'How does a time use perspective inform assessment and interventions within community mental health practice?'*

2 Materials and methods

This scoping study utilized the method originally developed by Arksey and O'Malley (31) and further elaborated by Levac et al. (32). It includes six steps: a) identifying the research question; b) identifying relevant studies; c) study selection; d) charting the data; e) collating and synthesizing the results; and f) consultation. While a protocol was not registered for this scoping review, the reporting of this scoping review conforms to the PRISMA Extension for Scoping Reviews (PRISMA-ScR) (33).

The research team consisted of senior academics and community mental health clinicians with substantial research and practice experience of time use assessment and intervention. The team identified the review question from their professional knowledge of gaps in current understanding and applications of a time use perspective in mental health practice. The review began with a preliminary search on Google Scholar guided by the SPICE framework (34) to assist in identifying the key concepts (Table 1).

The final search strategy was developed in consultation with a university librarian with expertise in health databases; and tested through a trial search of the EBSCOHOST platform. Examples of the search terms included *"Mental disorder*"* or *"Psychotic disorder*"* or *"Schizophreni*"* or *"Mental illness*"* or *"Psychosocial disability*"* or *"Psychiatric disorder*"* or *"Psychiatric patient*"* or *"Mentally ill"*; AND *"Time use"* or *"time use"* or *"Use of time"* or *"Occupational balance"* or *"Occupational engagement*"*. Supplementary Table S1 in Supplementary Materials presents the search strategy.

TABLE 1 SPICE framework terms.

Category	Terms
Setting	Community
Perspective	adults, older adults, patients, consumers, service-users, clients, mental health, mental illness, psychiatry
Phenomenon of Interest	Time-use, engagement in activities
Comparison	Not applicable
Evaluation	Quantitative, qualitative and mixed methods studies reporting primary research

The search strategy included limiters to ensure sources were peer-reviewed, published in English and included adults (age 18 or older). Book chapters, conference papers, theses, pre-prints, study protocols and letters were excluded. No time limits were set, so as to locate any studies focused on time use applications in community mental health practice. Nine databases were selected to identify studies meeting the inclusion criteria, including five databases within EBSCOHOST platform (Academic Search Complete; CINAHL Complete; Health Source – Nursing/academic; Social Work abstracts; SocINDEX) and four other databases: PsycInfo, PsycArticles, Scopus, and Web of Science. The database searches were last updated in June 2024.

After duplicate removal, 487 studies were imported to Covidence for screening. Two authors (ND, EF) independently screened all studies, with disagreements discussed and resolved by consensus in regular meetings. Title and abstract screening excluded 345 studies, leaving 142 sources to proceed to full-text review. At this stage, the reference lists of included studies were searched for further potentially relevant sources. Google scholar was also used for citation tracking and searches of key authors or journals to retrieve studies that may have been missed in the database searches. These processes identified a further 20 potentially relevant studies for full text screening. Therefore, the full text of 162 studies were reviewed for eligibility, resulting in 29 studies being included in this review based on the following criteria:

a) studies were of time use assessments, time use as an outcome measure or time use focused interventions (i.e. studies describing time use patterns, time spent in specific activities such as employment, internet-use, or physical activity, or investigating time use associations with clinical and socio-demographic factors were excluded);

b) study participants were people with severe or persistent mental illness, defined as a primary diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, or other severe and enduring psychotic disorder (29) (i.e. studies involving people with other diagnoses such as depression and anxiety were excluded);

c) studies were conducted in community or outpatient setting (e.g. excluding studies in inpatient or secure settings); and

d) papers reported original studies (i.e. excluding reviews, protocols and secondary analyses).

Figure 1 illustrates the screening and selection processes, using a PRISMA flow diagram (35). The resulting studies were grouped into three main categories: 1) development and psychometric testing of time use assessments (n=7); 2) studies using time use as an outcome measure (n=12); and 3) studies of time use focused interventions (n=10).

Data were extracted from the 29 studies according to key fields suggested by Arksey and O'Malley (31): authors, location, study aim, methodology and design, and key findings. Additional fields relevant to our review question were used to record details about participants (e.g. diagnosis, gender), time use assessments, outcome measures and interventions, as well as other data collection methods, implications and limitations. The team developed the

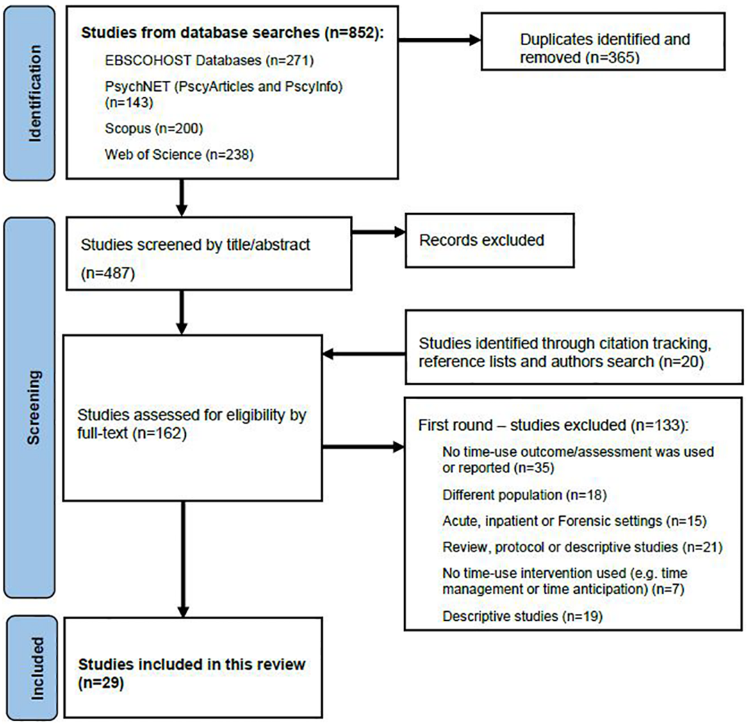

FIGURE 1
PRISMA flow diagram of the screening and selection of studies.

data extraction template, with all data extracted by a single author (ND) and presented in three separate tables based on the review question: time use assessments, time use as an outcome measure, and time use focused interventions. Within each table, similarities and differences between the studies were compared. For example, similarities between approaches to completing time use assessments, and in the development and delivery of time use interventions, were compiled by two authors (ND, EF), to synthesize the results.

3 Results

3.1 Study characteristics

The 29 included studies were published between 2006 – 2023. The majority were from Sweden (n=14), followed by the UK (n=7), Canada (n=2), Italy (n=2), Australia (n=2), Denmark (n=1) and Portugal (n=1). Most studies recruited participants from community mental health settings; three studies recruited participants from multiple settings including in-patient, residential and outpatient clinics; and two recruited from supported residential settings. Study methodologies included randomized control trials (n=14), psychometric testing (n=5), qualitative methods (n=5), pilot or feasibility studies (n=3), one correlational study, and one mixed-methods study. Most studies were designed and conducted by occupational therapists (n=20) including four studies that developed or tested time use assessments, and all studies of time use interventions. Others involved the disciplines of psychiatry, psychology and social sciences.

3.2 Time use assessments

Seven studies reported on the development, psychometric testing or practice application of time use assessments (Table 2). Two of these assessment tools are based on time use diary methods and one uses the Experience Sampling Method (ESM), as described below.

3.2.1 Development of time use assessments

Four studies reported the development and psychometric testing of the Profiles of Occupational Engagement in people with schizophrenia (POES) (36–38). The POES was developed by occupational therapists drawing on accounts of time use and occupational engagement from people diagnosed with schizophrenia (43, 44), previous literature and the authors' clinical expertise.

The POES utilizes a 24-hour time use diary designed for a person to report their activities in one-hour blocks of time for the preceding weekday. It asks the person to record their activities (i.e. what they were doing, and how long for), the place and the social context (i.e. who else was present or if on their own), and a personal reflection or comment about how the activity was experienced. This is supplemented by an interview (typically about 45 minutes) to support the person's completion of the diary and reflection on personal experiences related to the activities recorded in it. The

TABLE 2 Studies of time-use assessments (n=7).

Author (year)	Location & Setting	Aim	Design	Participants	Time-use measures (content and structure)	Findings	Implications
Bejerholm et al. (2006) (36)	Sweden; outpatient services	To develop and examine psychometric properties of the POES on measuring engagement in daily activities (part of a larger study investigating daily occupations, health, quality of life and wellbeing)	Cross-sectional correlational; psychometric testing	Time-use diaries of adults with schizophrenia randomly selected from the larger study (n=41); (10 to construct the pilot version of the POES, 4 for content validation, 27 for interrater reliability and internal consistency)	Time-use diary (POES): • Developed from qualitative data and accounts of time-use from people with schizophrenia • Measures time-use during past 24 hours for a weekday • Separated in 1-hour intervals • Four columns: occupation/ activity, geographical and social environment, personal reflection • A self-report questionnaire, supplemented by an interview to ensure completion and recall; and to help validity • Completion takes 45 minutes	• POES has relevant content and can be used. Items reflect occupational engagement, severity of symptoms and environment among people with schizophrenia • POES can estimate engagement in real-life activities • Good interrater reliability, high Cronbach's alpha value, and consistency in testing procedures with exception of one item (initiating performance). • Training and manual for POES users should be developed to ensure consistency	• POES is suitable to use in community-based and client-centered practice. • POES can help assessing life changes, social interactions; and the impact of personal (e.g. impacts of symptoms and medication) and environmental factors (e.g. hospitalization, social isolation). • POES provides an initial step in identifying occupational problems, imbalance between rest and activity, environmental opportunities; and needs. • POES can be used as an outcome measure to evaluate effectiveness of interventions in real-life.
(Bejerholm & Eklund, 2006a) (37)	Sweden; outpatient services	To examine the validity of the construct underlying the POES	Cross sectional correlational; psychometric testing	Time-use diaries of adults with schizophrenia randomly selected from the larger study (n=41); and interpreted by occupational therapists (n=12)	Time-use diary (POES) (further developed from 36): • Includes 9 items: 1) daily rhythm of activity and rest, 2) place, 3) variety and range of activities, 4) social environment, 5) social interactions, 6) interpretations, 7) meaningfulness of activities, 8) routine, 9) initiating performance. • Each of the items is rated and plotted on a graph to demonstrate a profile.	• Basic construct validity was established; moderate relationship between POES, functioning and satisfactions • Items with strong correlation were: 'Daily Rhythm', 'Variety and range' and Activity Level' • POES provides information on clients' real-life functioning	• POES can supplement symptomology to understand wellbeing in real-life context, extent of engagement, impact of clinical symptoms on client's day-to-day life, imbalance between rest and activities, and meaning • POES can help goal setting.
(Bejerholm & Lundgren-Nilsson, 2015) (38)	Sweden; outpatient units	To establish the internal construct validity of the POES using the Rasch measurement model	Cross-sectional; Psychometric testing study using	Adults with severe mental illness (n=192)	Time-use diary (POES) (see 36)	• POES has internal construct validity and represents occupational engagement, rhythm of activity and rest, routines, meaningful occupations and involvement in social environments. • High reliability and acceptable overall person-fit but some misfit of items ('interpretations' and 'initiating performance' were the most difficult items; place the least difficult). • Communication and interaction	POES can inform evidence-based practices; and help to identify social engagement, and communication skills

(Continued)

TABLE 2 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Time-use measures (content and structure)	Findings	Implications
						skills may be associated with engagement in social environments	
Jolley et al. (2006) (39)	UK; Part of a larger study; inpatient and outpatient settings	1. To validate a simplified time budget measure of activity in psychosis; 2. To study the relationship between time-use and symptoms of psychosis, distress and affect	Descriptive cross-sectional design; Psychometric testing	Adults with a current diagnosis of non-affective psychosis; (n=276)	Time budget measure: • Diary for a typical week completed in a structured interview; • 4 time blocks for each day (28 time blocks overall); • Rated from 0-4 based on activity engagement, diversity, complexities and demands, motivation and planning; and social contacts	• The validity of the time-use measure was supported as an indicator of social functioning. • Time-use scores varied widely; most participants were engaging in passive, or active but simple and brief activities (rating 1 or 2). • Moderate relationships were found between time-use measure, social functioning and symptoms • IQ, negative symptoms and distress were identified as a predictor of time-use in regression analysis • No correlations between demographic variable and the time-use.	The time-use budget may be used to identify social functioning and clinical symptoms.
(Larivière et al., 2017) (40)	Quebec, Canada; Community settings (not indicated explicitly)	1. To translate the POES into French; 2. To establish the interrater reliability of the French version	Cross-sectional; Psychometric testing	Adults with schizophrenia or schizoaffective (n=23)	The French POES (see above, 36): • French POES interpretations: i) 9-18=low engagement; 19-27=moderate engagement; 28-36=high engagement; • Analysis of occupational balance to demonstrate under-/over-occupied or good balance.	• French POES mean scores ranged 19-36 (moderate occupational engagement on average). • High interrater reliability, with lower agreement on social environment, interpretation and meaningfulness of activities. • Some terms and expressions needed further verification or clarity in the French POES	• French POES can be used as a structure for clinicians to measure time-use, and a supplementary tool to enable the person to reflect on their activity engagement. • POES can be used in psychosocial rehabilitation to gain understanding about the individual and to tailor interventions based on their needs.
(Cristina Zarbo et al., 2022) (41)	Northern Italy; Psychiatric Residential Facilities and outpatient settings	To investigate adherence to and usability of 7-day monitoring with ESM and Actigraphy among a sample of individuals with SSD and paired healthy controls	Mixed-method convergent parallel study	Patients with SSD in Psychiatric residential facilities (n=22) and outpatient settings (n=20); and healthy matched individuals (n=26)	Smart-phone ESM: • Brief questionnaire about current activities and mood on a smartphone 8 times a day for 7 consecutive days • Actigraphy to monitor physical activity and sleep (e.g. steps, activity intensity, sedentary time and sleep)	• Lower usability and response rate of mobile ESM in residential participants • Significant negative correlation between usability and adherence to actigraphy • Qualitative findings on usability of ESM and actigraphy: 1) Positive and negative effects of monitoring 2) Factors influencing adherence: motivation, technical features and differences of the both devices,	• The e-monitoring approaches (ESM and actigraphy) have a potential for clinical practice particularly for residential settings (e.g. for remote monitoring during COVID-19 pandemic) • Optimizing the technical features of ESM and actigraphy based on participants' concerns is important • Training on the use of devices, and positive aspects of

(Continued)

TABLE 2 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Time-use measures (content and structure)	Findings	Implications
						notifications and interruption with daily activities, duration of monitoring, residential rules or setting, number of days and hours of monitoring. 3) Emotions and mental states (e.g. negative and positive emotions such as annoyance, discomfort, interest, pleasure and satisfaction) 4) Advise (on device features, advise related to time)	devices can be reinforced by staff to assist with self-monitoring, self-reflection, confidence and feeling supported. • Not suitable for people at risk of developing positive symptoms (e.g. delusion of control).
(Zarbo, Zamparini, Nielssen, et al., 2023) (42)	Northern Italy; Psychiatric Residential Facilities and outpatient settings (part of a larger study)	1. To compare adherence to EMS among people with SSD in (residents and outpatient) and control individuals; 2. To investigate the patterns, socio-demographic and clinical predictors of adherence	Cross sectional descriptive and correlational	People with SSD (n=131) in residential facilities (n=74) and outpatient settings (n=57); and healthy individuals (n=115)	Smartphone EMS to assess daily time-use and mood: • brief questionnaire about current activity, 8 times a day for 7 consecutive days • notification to questionnaire between 8am-24am; semi-randomized, with a reminder if not responded.	• Overall adherence was 50% for residents and 58% for outpatients. • Lower adherence to ESM among people with SSD compared to control group. • Decrease in adherence in late evening and after 6 days; • Higher self-esteem and collaboration skills predicted higher adherence; • Socio-demographic characteristics, cognitive functioning and other clinical features had no effect on adherence; • Positive symptoms had a negative impact on adherence (e.g. suspiciousness, hallucination and unusual thought content)	ESM method as a potential approach to measure activities, yet low adherence needs to be considered: 1) ESM within waking hours (e.g. 8am to 8pm) and fewer days; 2) Training for participants and staff about the ESM and smartphone approach 3) Improving participants self-confidence on use of technology

POES, Profiles of Occupational Engagement in people with Schizophrenia; ESM, Experience Sampling Method; SSD, Schizophrenia Spectrum Disorders; RCT, Randomized Controlled trial.

POES also allows the rating of activity engagement across nine key areas: 1) daily balance of activity and rest; 2) geographical location; 3) variety and range of activities; 4) social environment; 5) social interactions, 6) individuals' experiences and interpretations; 7) meaningfulness of activities and/or contribution to wellbeing; 8) daily routines; and 9) initiating performance. Each is rated on a 4-point scale (36–38), highlighting personal and contextual factors that contribute to patterns of time use and activity engagement.

The POES was reported to have good interrater reliability, construct validity, and utility in understanding individuals' level of engagement, wellbeing, functioning and social participation (36–38). A French version developed in Canada also demonstrated sound psychometric properties and utility as a measure of activity engagement in the mental health context (40). Bejerholm and colleagues further suggest the POES is relevant for mental health practitioners to use since it accurately reflects activity engagement in real-life settings and may aid understanding of how not only psychiatric symptoms and treatments (e.g. medication) but also available resources impact the everyday lives of individuals experiencing severe mental illnesses.

Another time diary-based activity measure intended for routine clinical use with individuals living with psychosis was developed by Jolley et al. (39). Their simplified time budget is completed in a structured interview designed to record a person's activities over seven days in four daily blocks of time, and to support recall of activities and social contacts. Activities are then rated by the interviewer on a 0-4 scale according to their demands (e.g. whether passive, active but simple, or more complex or socially demanding activities). Jolley et al. (39) reported that this simplified time budget is able to discriminate levels of activity, showed stronger associations with symptom distress than symptom severity, and suggested its use as an indicator of social functioning.

The third identified assessment was a smartphone-based Experience Sampling Method (ESM) for assessment and monitoring of daily life experiences, such as activities, mood, sleep, and symptomatology. In a series of mixed-method studies, Cristina Zarbo et al. (20), Zarbo et al. (41) and Zarbo et al. (42) investigated the feasibility of using smartphone-based brief questionnaire to prompt sampling of experiences of current activities and mood in real time at eight intervals daily (between 8am to midnight) over a week. Their findings suggested the ESM as a useful tool for supporting people with severe mental illness to reflect on their activity engagement, and for staff to gain insights into their daily lives in community settings where regular assessment may be challenging. Some participants disliked the technical features of this approach and its interruptions to their daily activities, while the authors also acknowledged that ESM may be experienced as intrusive or distressing in the context of positive symptoms and recommended reduced sampling times, better training and technical support.

3.2.2 Application in practice

The time use assessment methods identified in this review provide varied ways to gather information on time use patterns and influencing factors in real-life contexts including, for example, resources, supports, symptoms, medication and satisfaction (20, 36, 37, 41). They also provide tangible information readily transferable to collaborative priority setting and planning (36, 37). The POES, for example, includes contextual information about places and people with whom activities are completed, from which resources to support change may be identified (36, 37). In comparison, the simplified time budget (39) may be easier to complete than the POES and less intrusive than the Experience Sampling-based approach. Since it focuses more on the level of activity involvement than on dimensions of activity engagement and experience, it may also be less useful to guide interventions. While originating in occupational therapy, the POES could be used by mental health professionals widely to guide person-centered and evidence-based community practice (40). The potential of the POES and ESM methods to support self-reflection also suggests their potential relevance for facilitating the process of personal recovery.

3.3 Time use as an outcome measure to evaluate effectiveness of interventions

Twelve studies (including three sub-studies from a larger project) measured time use as an outcome when evaluating the effectiveness of psychosocial and occupational interventions (Table 3). These interventions included staff training about activity engagement, its importance for addressing mental illness and approaches to encourage engagement (49); Individual Placement and Support (IPS) (45, 48); cognitive remediation (50); Social Recovery Therapy (SRT) (based on cognitive behavioral strategies) (52–54); a befriending program (56); lifestyle modification (51) and occupational therapy group programs (55).

Six of the intervention studies measured time use as an outcome using a Time Use Survey (TUS). Adapted from the UK 2000 Time Use Survey for general population (58), the TUS is completed via semi-structured interview and asks about time spent over the past month in activities that include work, education, volunteering, leisure, sport, hobbies, socializing, household chores, resting, childcare and sleep. To date, the TUS has been variously used to measure time spent in structured activities (excluding resting and sleep) as an indicator of overall functioning (50, 52, 53); economic and structured activity participation (55); social participation (e.g. places visited and people with whom activities were completed) (56); and time use as an indicator of social recovery (54). In two studies, cut-off scores for social disability (≤30 hours per week in structured activities) (53) and isolation (< 1 hour per day in recreational or social activities) (56) were applied to determine participants' eligibility for the intervention, although neither reported how the cut-off scores were determined. Fowler et al. (53, 54) found that the SRT was effective in improving engagement in structured and economic activities. Fowler et al. (54) and Inman et al. (55) concluded respectively that the TUS is a relevant and sensitive measure of real-world functioning, and a suitable outcome measure for evaluating individualized occupational therapy interventions.

TABLE 3 Studies using time-use as an outcome measure to evaluate interventions (n+12).

Author (year)	Location & Setting	Aim	Design	Participants	Application of time-use measures	Interventions/approaches	Main findings	Implications
Areberg et al. (2013) (45)	Sweden; Community and vocational rehabilitation settings	To examine effectiveness of IPS on occupational engagement, work motivation, empowerment and QOL among people with severe mental illness	RCT	Adults with long-term psychosis or psychiatric disability; randomly allocated to IPS (n=60) and TVR (n=60) groups	POES completed at baseline, 6 and 18 months via interview	IPS: • Employment specialists (occupational therapists, nurses and a social worker) using the principles of IPS • IPS training and supervision (every fortnight) was provided. • Fidelity was measured: good at 6 months, and excellent at 12 and 18 month. TVR group received vocational services in health and social services including pre-vocational training or work-related activities in sheltered settings.	• No differences between groups in occupational engagement and empowerment at 6 months; • At 18 months, IPS had a positive effect on QOL, work motivation, empowerment and occupational engagement as measured by time-use patterns (engagement in daily activities and community life)	IPS is a valuable process towards personal recovery that encourages connectedness and life satisfaction. Client-centered approaches to employment such as IPS enhances work motivation and empowerment.
Argentzell et al. (2020) (46)	Sweden; Community mental health settings	1) To investigate whether aspects of activity, socio-demographic and clinical factors mediate or moderate changes in recovery; 2) To explore the possible effect of the BEL intervention compared to standard OT intervention on personal recovery	Part of an RCT (47)	Adults with mental illness assigned to BEL group (n=133) and SOT (n=93)	• POES self-report version; • SDO-OB: four segments including work and study, leisure, home tasks, and care of self; with yes/no options to measure satisfaction and activity balance.	BEL intervention (see 47): • A manualized group- and activity-based program with 14 sessions over 16 weeks (including 2 booster sessions) • Led by trained occupational therapists • Topics were on everyday life, meaningful activities, motivators, healthy living, work-related and social activities • using an educational approach and homework • encourages reflecting on the current life, goals and strategies to reach them; and engagement in real-life activities SOT: • Group and individualized sessions including activities (e.g. arts, crafts or creative activities, daily living and social skills).	• The mediators included: activity engagement, activity level and balance, satisfaction with activities, psychosocial functioning, symptom severity and sense of mastery. • Strongest mediators were activity engagement and mastery, followed by satisfaction and symptoms. • No difference between the BEL and standard OT groups in recovery • Participants with diagnosis of depression/anxiety reported lower recovery scores.	To support recovery, interventions should facilitate meaningful activity engagement to enable control and independence
(Bejerholm et al., 2015) (48)	Sweden, Community mental Health settings	To determine effectiveness of IPS on vocational outcomes and community integration	RCT	People with psychosis or a psychiatric disability (n=120)	Time-use assessed by the POES as primary outcome: • Time-use for a yesterday with 1-hour intervals • Assessed time-use in 9 items on a 4-point scale (see 36) • Data were collected at baseline, at IPS completion (18months),	IPS: • IPS training provided to 3 employment specialists, plus supervision every 2 weeks throughout the trial • The employment specialists, a steering committee, a process leader and a supervisor formed the IPS organization with regular meetings during the study • IPS was integrated with the mental healthcare service with good to excellent fidelity. • Control group received TVR including	• Attrition rate was 28% with no difference between the participants who left and stayed at 6 months follow up; • At 6-months no significant differences between the groups in vocational outcomes. • At 18-months, IPS was more effective in gaining competitive employment, working hours and weeks, job tenure, income and rapidity of gaining employment. • 90% in IPS group worked or had an	The IPS is effective in gaining employment within a shorter period of time, more days and weeks at employment and higher income.

(Continued)

TABLE 3 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Application of time-use measures	Interventions/approaches	Main findings	Implications
					and 6 and 18 months follow-up.	prevocational training in sheltered settings; and clubhouse activities	internship compared to 24% in the control group who stayed mainly in prevocational and segregated settings. • TVR group had increased psychosis and depressive symptoms.	
Cardoso et al. (2017) (49)	Portugal; residential mental health units	To assess the efficacy of a staff training to improve service users' engagement in activities	Cluster RCT	Adults with schizophrenia randomly allocated to control (n=84) and intervention group (n=73)	TUD as a primary outcome: • Completed retrospectively in a structured interview; • Recorded in morning, noon, afternoon, and evening time periods; • Rated on a scale of 0-4 for each item with a maximum possible score of 112 • Higher scores reflect higher and more complex engagement in activities. • Completed at baseline, 4 and 8 months.	Staff training provided knowledge and strategies on impact of mental illness (e.g. cognition and motivation), importance of activity engagement, ways to engage service-users in activities, barriers and action planning. Training was provided to nurses and unqualified unit staff, delivered by an Occupational therapist, an activity worker and a user expert.	• Staff training helped in improving service users' engagement, but effectiveness was not significant. • The intervention may be more effective for younger service users who had higher level of engagement at baseline • Service users with long-term stay may be resistant to change • No significant improvement in QOL, or service-users' experience of the service.	The training may be useful to increase staff knowledge about aspects of care, but did not lead to long-term results.
Cella et al. (2019) (50)	UK; community clinics	To explore correlations between cognitive remediation (CR) and therapeutic outcomes	correlational cross-sectional study (part of a larger RCT)	Adults with schizophrenia or schizoaffective, with cognitive difficulties randomized to CR (n=38) and TAU (n=8) groups	TUS: • Time spent in structured activities to assess functioning • Semi-structured interview with retrospective report of the time spent in activities such as work, education, volunteering, leisure, sports, socializing, hobbies, resting, household chores, childcare and sleep.	CR: • Delivered by psychologists using a web-based computerized software • Targeted cognition, meta-cognition, strategy use, and transfer of learning. • The tasks included attention, memory and executive functioning. • CR was offered 3/week over 12 weeks, maximum of 40 sessions, 1 hour each	• The number and intensity of tasks were related to the use of strategies • No correlation between errorless learning and the measures of time-use • Therapeutic alliance was correlated to numbers and usefulness of strategies, cognitive and functional improvement	Therapeutic alliance enhances improvements in cognitive and functional outcomes. CR therapists can help transfer of cognitive skills to everyday lives.
Eklund et al. (2020) (51)	Sweden; supported housing	To explore changes in occupational engagement, personal recovery, psychosocial functioning and	Pilot feasibility study	Adult residents with mental illness who received AiMH program (n=29)	POES to assess occupational engagement; completed via interview. Measured at baseline, 6 and 9-months follow up	AiMH: • Informed by two previous interventions: a) a staff program to enrich the facility with meaningful activities; and b) an activity-based lifestyle intervention to support occupational engagement and	• Participation in AIMH improved occupational engagement and personal recovery from baseline to completion of AiMH. • Improvement in occupational engagement remained statistically	The AiMH can encourage occupational engagement.

(Continued)

TABLE 3 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Application of time-use measures	Interventions/approaches	Main findings	Implications
		symptom severity following the AiMH program				balance. • Led by an occupational therapist who completed training; • The AiMH included 8 (5 individual and 3 group) sessions, 35-40 minutes each, over 12 weeks; • Themes of the sessions include motivation, senses and coping with stress, activities and health, dreams and goals; • Sessions included psychoeducation, and activity experimentation; • Each participants received €20 to spend in meaningful activities in between of the sessions supported by staff.	significant at follow-up (e.g. routine, variations in activities and in social and geographical locations) • Participants' view on provision of meaningful activities remained unchanged. • Improvements in psychosocial functioning and symptoms severity were not statistically significant. • Participants satisfaction with AiMH was 75% • No correlations between satisfaction with housing and activity engagement	
Fowler et al. (2009) (52)	UK; secondary mental health services	To evaluate a cognitive behavioral intervention to improve social recovery (SRCBT) for young people with early psychosis	RCT	Young adults with psychosis and social disability allocated to SRCBT (n=35) and TAU (n=42) groups.	TUS as primary outcome to assess functioning: • Completed through face-to-face semi-structured interview; • Measures number of hours spent in activities per week over the past month. • Activities include: work, education, volunteering, leisure, sport, hobbies, socializing, house chores, resting, childcare and sleep. • Hours in constructive economic and structured activities per week are calculated. • Constructive economic activities include: work, education, volunteering, house chores, and childcare; structured activities also include hobbies, sports and leisure. • Completed at 9-month post intervention.	SRCBT: • Combined CBT and vocational case management • 3 stages: 1) assessment and formulation; 2) working towards goals, identifying pathways to meaningful activities, enabling engagement; 3) promotion of activities related to goals and managing symptoms. • Strategies from CBT (e.g. activity scheduling, behavioral experiments and problem solving) • SRCBT included 12 sessions over 9 months delivered by case managers TAU group received active case management by a multidisciplinary team.	• No significant differences in time-use, functioning, psychotic and emotional symptoms, QOL, and needs • Larger trials are recommended.	• The role of case managers in instilling hope and encouraging engagement in meaningful activities is important. • TUS is a sensitive measure to reflect changes in activities

(Continued)

TABLE 3 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Application of time-use measures	Interventions/approaches	Main findings	Implications
Fowler et al. (2018) (53)	UK; Early Intervention Service	To assess the efficacy of SRT in improving time spent in structured activities.	RCT	Young adults (aged 16-35) with non-affective first episode psychosis and low level of engagement in structured activities (≤30 h/week in TUS) allocated to SRT (n=76) and TAU (n=79) groups	TUS (see 52) to measure time spent in structured activities in the past month to assess social recovery. Completed at 9- months (post intervention) and 15-months (6-month follow-up).	SRT provided in addition to early interventions: • Drawn from SRCBT; • Manualized intervention including 3 stages; • Delivered in minimum of 6 sessions (see 52) ii) TAU received early interventions.	• SRT led to improved engagement in structured activities by 8.1 hours at 9 months (post interventions) and follow-up.	SRT may be useful in improving functional outcomes particularly for individuals less motivated to engage in existing psychosocial interventions.
Fowler et al. (2021) (54)	UK; Community mental health settings	To determine clinical and cost-effectiveness of SRT in young people with non-psychotic severe mental health problems at risk of social disability.	RCT	Young adults (aged 16-25) with non-psychotic severe mental illness allocated to SRT (n=135) and control (n=135) groups	TUS as primary outcome as indicator of social recovery (see 52); Measured 15 months post randomization	SRT delivered in addition to enhanced standard care: • Manualized individual intervention, further developed from SRCBT (52) • Delivered over 9 months in participants' homes individually and face-to-face; • Include 3 stages: 1) assessment and formulation; 2) working towards goals, identifying pathways to meaningful activities, enabling engagement in vocational or educational activities (e.g. liaison or referral); 3) promotion of activities related to meaningful goals and managing symptoms using cognitive behavioral techniques. iii) Control group received enhanced standard care (i.e. evidence-based treatments)	• General significant improvements in both groups in engagement in structured and economic activities; • No differences in SRT compared to enhanced standard care in engagement in structured activities; • No significant differences in social anxiety, depression, and symptoms severity; • SRT was not estimated cost effective.	Activity engagement (TUS) is a relevant outcome measure. Person-centered interventions for young people are important.
Inman et al. (2021) (55)	UK; community mental health and psychosis teams	To evaluate feasibility of a pragmatic clinical trial (POINTER) for people with psychosis	Exploratory pre-/post-test feasibility	People with diagnosis of psychosis with functional needs (n=20)	TUS as a primary outcome measure: time spent in constructive economic activity and structured activity per week.	Occupational Interventions: • To improve participation in meaningful activities identified by participants; • Program objectives: 1) to assess occupational performance; 2) to formulate occupational needs; 3) to set goals; 4&5) to plan and implement interventions; 6) re-assess occupational performance; 7) review occupational need and goals; 8) discharge from occupational therapy	• 14 participants completed the program, and a total of 188 sessions were delivered. • Modifications to the program were made as required (e.g. related to care coordination). • Improvement in HRQOL (health burdens, and general improvement in self-evaluated transition in health), and better health in general. • Majority (71%) of participants were satisfied with the program, and their	It is important to use a pragmatic approach to measure feasibility, fidelity and adherence to occupational therapy interventions. POINTER is a valid approach to report

(Continued)

TABLE 3 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Application of time-use measures	Interventions/approaches	Main findings	Implications
						• Provided by occupational therapists in face-to-face and individualized sessions; in participants' homes or community • Provided 1-2 times per weeks for up to 6 months • The intervention was tailored to each participants based on their needs and goals • Fidelity and adherence were measured, and any modification was reported by occupational therapists	participation meaningful activities. • Positive outcomes reported in time-use, experience and satisfaction of occupational performance and participation. • TUS and other outcome measures created minimal burden for participants. • 'Doing Occupational Therapy Research in Practice' emerged from the data including: 1) recruitment; 2) balancing research and practice; 3) utility of the occupational intervention log; 4) occupational therapy log revealed the intricacies of practice; 5) rating adherence; and 6) outcome measurement procedures.	individualized occupational therapy interventions.
Priebe et al. (2020) (56)	UK; Community mental health services	To assess effectiveness of a befriending program to reduce social isolation and improve health and social outcomes for people with schizophrenia	Parallel RCT	Adults with schizophrenia and social isolation (<60 min/day in social activities as measured by TUS) allocated to intervention (n=63) and control groups (n=61); volunteers recruited from local community (n=51)	TUS as primary outcome: • Adapted for people with schizophrenia • Measured minutes/day spent in activities. • Assessed at baseline, 1 week and 12 months in the program; and 6-month follow up. (Details on how TUS was completed were not provided in the study).	Volunteer befriending program: • Participants were matched with volunteers based on their interests and preferences; • An activity booklet (list of free or inexpensive activities in the local community) was provided to participants and volunteers; • Volunteer and participants met weekly for 1 year to engage in activities of their mutual interests and preferences • Monthly social events • Volunteers reported occurrence, length and content to the volunteer coordinator. • Control group met with a masked researcher who provided the activity booklet and spoke about the activities to engage in.	• 22% of the participants were not marched to volunteers (5 ineligible, 1 no longer interested once a volunteer become available) • Half of the sample had the expected number of meetings (at least 13) with average duration of 90 minutes. • 15 social events were organized with 6 participants on average. • No significant difference between the intervention and control group in TUS: improvement in both groups in time spent in activities at completion of the program and 6 months follow-up. • Improvement in social contacts after the program and 6-month follow-up in intervention group • No association between the improvements and symptoms, QOL or self-esteem • No association between compliance and primary outcome	Need for flexibility in befriending programs to accommodate needs and changes in preferences over time.
Bjørkedal et al. (2023) (57)	Denmark; community mental health centers	To investigate the effectiveness of an occupational therapy	RCT	Adults with a psychiatric disability and functional impairments randomly allocated to intervention	POES as the primary outcome measure of activity engagement;	MA&R: • 22 (alternate group and individuals) sessions • Topics included activities, health,	• Improvements in the MA&R group did not differ significantly with the control group in activity engagement,	Individualized and peer support are important to

(Continued)

TABLE 3 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Application of time-use measures	Interventions/approaches	Main findings	Implications
		intervention focusing on activity engagement, functioning and recovery co-led by peer worker		(n=67) and control groups (n=69)	Competed at baseline and after the intervention	recovery and strategies for activity engagement; • Group sessions were facilitated by a peer worker and occupational therapist; • Sessions included presentations, reflective questions, workbook and peer exchange; some sessions included other methods such as stories and photovoice	personal recovery, functioning and QOL	consider in interventions.

TUD, Time-use Diary; CR, Cognitive Remediation; TAU, Treatment as usual; POINTER, Participation through Occupational Intervention Effectiveness; Research; TUS, Time-use Survey; HRQOL, Health-related quality of life; IPS, Individual Placement and Support; TVR, traditional vocational rehabilitation; QOL, Quality of life; BEL, Balancing Everyday Life; SOT, Standard Occupational Therapy; SDO-OB, Satisfaction with Daily Occupations and Occupational balance; AiMH, Active in My Home; IPA, Interpretive Phenomenological Analysis; SRT, Social recovery therapy; SRCBT, Social Recovery Cognitive Behavioral Therapy; CBT, Cognitive Behavioral Therapy; MA&R, Meaningful Activities and Recovery.

Based on a similar approach to the TUS, the previously described time budget (39) was used by Cardoso et al. (49) to measure the effectiveness of a staff training program to improve the activity engagement of people with schizophrenia living in residential facilities. They reported improvements in activity engagement, although these were not statistically significant when compared with the control group. Given the time budget measures activity engagement in 4 blocks daily, it may possibly be less sensitive to activity changes than the POES that records activities at 1-hourly intervals.

Five identified intervention studies reported use of the POES (36, 37) as an outcome measure. POES has been used to measure activity engagement and community inclusion outcomes of IPS programs for people experiencing severe mental illness (45, 48), with significant improvements reported with more engagement in a range of activities and community contexts. Further, when used to measure the outcomes of a lifestyle intervention, Active in My Home (AiMH), for people living in supported housing, significant improvements in activity engagement measured by POES and personal recovery measured by QPR (59, 60) between baseline and completion of the AiMH intervention were reported (51). Further highlighting links between activity engagement and personal recovery outcomes, Argentzell et al. (46) used the POES in conjunction with the Satisfaction with Daily Occupations and Occupational Balance (SDO-OB) (61) to identify aspects of activity engagement (e.g. balance and meaning) associated with effectiveness of the manualized Balancing Everyday Life (BEL) intervention (described in the next section). They reported activity engagement, mastery, satisfaction and symptom severity as the strongest mediators of changes in personal recovery following the intervention. Lastly, Bjorkedal et al. (57) used the POES as a primacy outcome in an evaluation of the Meaningful Activities and Recovery (MA&R) intervention, which combines group and individual sessions and is co-delivered by an occupational therapist and a peer worker to encourage activity engagement and recovery through education, reflective questions, peer exchange of ideas, workbooks and creative methods. No significant improvements in activity engagement were found in the MA&R group compared to those receiving standard occupational therapy services, possibly due to similarities between MA&R and the standard service. Overall however, these five intervention studies suggest POES as a useful tool for evaluating the outcomes of interventions designed to enable changes in the nature and quality of time use patterns.

3.4 Time use focused interventions

Ten studies reported the development and evaluation of time use interventions, including Action over Inertia (AOI) (62, 63), Balancing Everyday Life (BEL) (47) and the Pathway to Participation (P2P) program (64). All three interventions were developed by occupational therapists and focus on participants' time use and developing strategies and supports to engage in desired activities (see Table 4).

TABLE 4 Studies of time-use focused interventions (n+10).

Author (year)	Location & Setting	Aim	Design	Participants	Outcome measures	Intervention	Main findings	Implications and limitations
Edgelow et al. (2011) (65)	Canada; ACT teams	To pilot evaluate efficacy of an occupational time-use intervention (AOI)	Pilot prospective RCT	People with SMI living in the community recruited from five ACTs (n=24)	• POES to measure activity engagement • Clinical utility was measured using questionnaires developed for this project	AOI: • Designed for community-dwelling SMI to reconnect them with meaningful activities; • Based on occupational balance and time-use, and recovery framework; • Includes elements on self-determination, psychoeducation and cognitive behavioral strategies; • Includes workbook tailored to individuals in 5 sections: 1) determining the need for change; 2) reflecting on the current balance of activities and making rapid changes to engage in activities; 3) education about SMI and occupational engagement; 4) long-term goal planning and support; 5) ongoing monitoring and refining the plan. • AOI was delivered throughout 12 weeks in individual sessions	• No significant differences between treatment and control group in occupational engagement measured by POES (except for sleep time). • The intervention helped participants to reflect on their time-use and activity patterns. • Therapists benefited from the structure and flexibility of the program, but suggested more time in goal setting	• The AOI can be used alongside with other evidence-based recovery-oriented programs to encourage engagement in meaningful activities through reflection and education. • The program duration may have not been enough to see changes in activity pattern. • Follow-up measurements would be helpful in future studies. • Challenges to recruiting participants and attrition rate should be considered in future studies.
Eklund et al. (14) (47)	Sweden; outpatient and community-based settings	To evaluate effectiveness of the 16-week Balancing Everyday Life (BEL) for people with mental illness	RCT	Adults with mental illness who self-report imbalance in daily activities, randomly assigned to BEL group (n=133) and CAU (n=93)	• sociodemographic and clinical data (self-report). • POES (self-report) to measure engagement in productive activities. • SDO-OB to evaluate satisfaction and activity balance. • OVal-pd to measure perceived values of everyday activities. • MANSA to measure QOL. • Rosenberg self-esteem scale. • First item of the MOS SF-36 to measure perceived health. • GAF to measure psychosocial functioning. iv) Completed at baseline,	The BEL: • Developed by occupational therapists. • Group-based program with 5-8 participants. • 12 sessions weekly plus 2 boosters within two-week intervals • The main themes included activity balance, meaning and motivation, healthy living, work-related activities, leisure and relaxation, and social activities. • Sessions included education, group activities and homework assignments completed between the sessions. • Sessions focus on the past, present and desired activities; and homework related to performing the desired activity in a real-life context to test the strategies. • Goals and strategies may be renegotiated through self-analysis, reflection and peer support. • The goal is to reach and maintain a desired balance in daily activities. • The BEL group was facilitated by two	• BEL was effective in improving engagement in doing, activity engagement and balance, psychosocial functioning, QOL, and symptoms. • The CAU group also improved in all outcomes, except activity level.	• BEL may be effective for improving functioning and activity engagement. • BEL is time effective. • External validity due to drop-out and lack of blinding may be limited. • The POES provided immediate feedback to participants that can help awareness on their time-use; and is a useful tool in time-use interventions.

(Continued)

TABLE 4 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Outcome measures	Intervention	Main findings	Implications and limitations
					after the BEL (16 weeks) and 6-month follow-up	therapists (one had BEL training) • Fidelity was self-rated by the facilitators.		
Eklund et al. (2023) (66)	Sweden; outpatient and community-based settings (see 47)	To explore implementation of the BEL intervention; and therapists' views on usefulness within a multi-professional team	Qualitative telephone interviews and content analysis	Occupational therapists (n=13); and managers (n=3) from various multiprofessional teams	Individual and/or joined semi-structured telephone interviews on the process and context of BEL, recruitment, fidelity and target groups.	The BEL (see 47)	• Conditions and opportunities (e.g. expectations of OT interventions and potential benefits of BEL; OTs' confidence and collaborations; positive and negative influence of the context). • Putting the BEL intervention (e.g. communication, recruitment, retention, adjustments to BEL, and time-use). 1) Experiences of BEL (e.g. specialized OT intervention, goal setting related to everyday life, structure and flexibility of the BEL, participants' commitments and outcomes)	• BEL is occupation-based and recovery-oriented with homework assignments that helped engagement. • Findings were predominantly from OTs than managers and may be specific to the study setting. • Further instructions for goal setting would be beneficial as participants did not always complete the homework tasks.
Hitch et al. (2022) (64)	Australia; CCUs, PARC and community mental health teams	To describe outcomes of a group program (P2P) to enable activity participation	Descriptive pilot longitudinal design	Adults with menta illness and psychosocial disability (n=17); 11 completed treatment and 8 completed follow-up	• Socio-demographic data • CANAS-P to assess needs over the past month in 22 domains of daily activities. • Time-use diary to measure time-use (including where and with who) for a yesterday with 1-hour intervals. • RAS-DS to measure recovery; • The BASIS-24 to measure psychosocial health and functioning; • LCQ to measure social participation; Completed at baseline, after the program and at 3-month follow-up.	P2P Program: • Developed in consultation with OTs. • To enable engagement in meaningful activities, activity balance and community participation. • Combines the AOI and the Works program (67) • Includes 10 weeks (first 4 weeks AOI, and 6 weeks based on the Works) • 2-hour sessions; consumers were encouraged to attend every session, but was not mandatory. • P2P includes a workbook that scaffolds activities from simple to more complex. • Delivered in a group by OTs and peer-support workers who completed P2P training and regular briefings and reflections	• Decrease in unmet and overall needs. • Increased participation in activities of daily living, productivity and leisure, but time spent in community activities remained unchanged. • Overall increase in recovery scores at follow-up. • No significant changes in psychosocial health. • Small increase in work participation and self-rating of wellbeing but not statistically significant.	• Structured follow-up with the facilitators and case managers helped the positive outcomes. • The P2P is suggested to be delivered by OTs. • External validity may be limited due to small sample size and drop-out; and recruitment from one catchment area in Melbourne.
Hultqvist et al.	Sweden; outpatient	To explore influence of care context, socio-	Longitudinal study (part	See 47	The measurements are the same as Eklund et al.,	The BEL (see 47)	• BEL was effective in both community and clinical	• Encouraging friendship and

(Continued)

TABLE 4 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Outcome measures	Intervention	Main findings	Implications and limitations
(2019) (68)	and community-based settings	demographic, clinical and self-related factors in predicting improvements in occupational engagement and QOL following the BEL intervention	of a larger RCT; 47)		(47) plus: The Pearlin Mastery Scale to estimate self-esteem and self-mastery v)		settings; and with diverse range of participants regardless of socio-demographic, clinical and self-related characteristics. • At 6-month, none of the measures were found as predictors. • At 18-month follow up, psychosocial functioning, friendship, depression and anxiety symptoms, female gender, age, and having children were the strongest predictors of change in occupational engagement and balance. • Self-mastery was negatively associated with changes in occupational balance in leisure domain.	belonging in the BEL program can enable improvement occupational engagement. • External validity is limited due to skewed sample, non-participants and high drop-out
Lund et al. (2019) (69)	Sweden; outpatient and community-based settings	To explore processes of making changes from participants' experiences	Qualitative grounded theory design (part of a larger RCT; 47)	Participant in BEL (n=14)	• 29 semi-structured interviews completed after the BEL intervention about person's background and experiences with BEL, and processes of making changes	The BEL (see 47)	Main category: 'Breaking a cycle of perceived failure' that included change processes towards a more balanced lifestyle: 1) Going gently; change is an ongoing process (e.g. identifying strategies, breaking down goals, being kind to oneself). 2) Supports for progress and permission to fail (e.g. supports and strategies for change, daring to try). 3) Prioritizing and setting boundaries (e.g. structuring and setting limits, taking control). 4) Adjusting for a sustainable balance (e.g. pacing oneself, coming to terms with oneself). 5) Caring for a valued self (e.g. utilizing resources, befriending self).	• Making change is an ongoing process with small steps and adjustment. • BEL provided a supportive structure to help participants identify their values and take action towards a balanced lifestyle. • Participants may have had a positive bias in favor of the BEL, and were limited to Swedish context. • Application and exploring usefulness of the BEL in different population would be beneficial.

(Continued)

TABLE 4 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Outcome measures	Intervention	Main findings	Implications and limitations
Lund et al. (2019) (70)	Sweden; outpatient and community-based settings	To explore participants' experience of meaning of participating in the BEL group	Qualitative grounded theory design (part of a larger RCT; 47)	Eight of the 14 settings were selected from the larger study to recruit participants (n=19) from 10 BEL groups using theoretical sampling	• 26 interviews were completed within 1 week to 6 months after completion of the BEL. • Interviews used open-ended questions on meanings, experiences and views about the group. • Interviewers were blind to the BEL content.	The BEL (see 47)	Meaning making through group participation, connection and support: 1) Joining with others: from alone to connected; from fears and isolation to socialization; not feeling alone with daily-life struggles. 2) Sense of belonging, feeling supported and understood: sharing in a safe context; good and bad days; group acceptance and understanding; expanding social network; bonding and healing through humor 3) Re-valuing self in a more positive way: facing old views and prejudices; reassessing perspectives (e.g. internalized stigma); feeling valued; respecting self and competencies; purpose and self-worth through helping others.	• Joining with others, belonging and universality are important elements of group process that can be enhanced through mutual support and supportive social environment. • Recruitment was through the group leaders which may have been coercive. • Findings may not be applicable to diverse communities as participants from a non-Swedish background were underrepresented (due to language barriers).
Lund et al. (2020) (71)	Sweden; outpatient and community-based settings	To gain an understanding of group leaders' and participants' perspectives of the BEL intervention (what helped, hinders or can be improved)	Qualitative grounded theory design (part of a larger RCT; 47)	Group leaders (n=12; including 10 OTs and 2 co-leaders) who have completed at least one BEL group. Participants (n=19) from 10 BEL groups.	• Focus groups for group leaders. • 29 interviews were completed within 1 week to 6 months after the BEL intervention, plus mid-course interviews for 4 participants, and follow-up interviews to test the theory	The BEL (see 47)	Content and format: • Group leaders and participants appreciated the BEL structure and content relevant to daily life, but desired flexibility to meet individuals' varying needs (e.g. some tasks needed to be adjusted to participants). • Making connections – BEL as a bridge (e.g. closed group structure to share personal experiences; connection to a future life). vi) Facilitating and hindering factors: • Group leaders: 1) Facilitating factors: relevant assessment and	• To consider more flexibility to tailor the group to individuals' unique and varying in the revised BEL manual. • Need for increasing the intervention time (e.g. to 15 weeks). • Consideration of the environment and resource planning (e.g. space or local trips) would be important. • Group leaders' communication skills are important in implementing the interventions. • Results may not be applicable to diverse

(Continued)

TABLE 4 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Outcome measures	Intervention	Main findings	Implications and limitations
							evidence-based manual, positive experiences of the participants. 2) Hindering factors: limited space or facilities, and group dynamics. • Participants: 1) Facilitating factors: group dynamics, goal setting and supporting change, feeling connected, competent facilitators, similar experiences with peers, and safe environment. 2) Hindering factors: differences in functioning, previous negative experiences, not having enough time in day-to-day life to implement personal goals or strategies learnt in BEL.	population as participants were limited to Swedish contexts (Due to language barriers).
Rees et al. (2021) (72)	Australia; CCUs	To understand participants' and facilitators' viewpoint about the use of the AOI in CCU settings	Qualitative naturalistic design	People with schizophrenia and schizoaffective disorders participate in the AOI (n=10), and group facilitators (n=5)	In-depth semi-structured dividual interviews about participants' activity patterns, recovery, goals and experiences of the AOI such as impacts on their routines and activity engagement.	The AOI: • Delivered in group format (3 groups overall) by an OT who completed AOI training. • Included 5-8 group sessions. • A facilitator guide was developed from the AOI manual relevant to the local setting.	Participants' experiences – Making change: • It's hard to get myself going and things get in the way; • Getting myself going; • Recognizing the value of meaningful activities; • Doing things bring a sense of hope and recovery; Facilitators' experiences – Facilitating change: • Recognizing inertia as a challenge; • Challenges of getting people going; • Getting people going; • How AOI works to impact inertia.	• Engagement in activities identified by participants can promote recovery. • AOI helped participants to identify barriers to participation and aim for an active living through reflection on their time-use and wellbeing. • AOI offers a flexible and individualized structure. • Findings from this small-scale study may not be applicable in other settings.
Eklund et al. (2023) (66)	Sweden; Community mental	To compare the BEL and TAU group in motivation for engaging in day centers, occupational	RCT (Part of a larger study (47)	Adults with psychiatric disability attending day centers	• Socio-demographic questionnaire • A 4-item scale developed for this study	The BEL in 14 session over 16-19 weeks (see 47)	• No significant differences between groups in motivation scores. • BEL group improved in	The BEL offers a novel approach to mental health services that can encourage engagement

(Continued)

TABLE 4 Continued

Author (year)	Location & Setting	Aim	Design	Participants	Outcome measures	Intervention	Main findings	Implications and limitations
	health settings	engagement and personal recovery		randomly allocated to BEL (n=4) and TAU (n=7) groups	to measure motivation (e.g. attending day center, clear goals, time-use and employment preferences). • POES to assess occupational engagement. • QPR to measure personal recovery. • Satisfaction with the day center and quality of support.		occupational engagement and personal recovery.	in meaningful life activities

ACT, Assertive Community Outreach; AOI, Action Over Inertia; SMI, Severe Mental illness; BEL, Balancing Everyday Life; CAU, Care as usual; Oval-pd, Occupational Value with predefined items; MANSA, Manchester Short Assessment of Quality of Life; QOL, quality of life; GAF, Global assessment of functioning; CCU, Continuing care units; PARC, Prevention and recovery care services; P2P, Pathway to Participation; CANSAS, Camberwell Assessment of Need Short Appraisal; RAS-DS, Recovery Assessment Scale—Domains and Stages (RAS-DS); BASIS-24, Behavior and Symptom Identification Scale; LCQ, Living in the Community Questionnaire; QPR, Questionnaire about the Process of Recovery.

3.4.1 Development, content and structure of the time use interventions

The three identified time use interventions are grounded in knowledge that what people do in everyday life matters for health and wellbeing; informed by recovery-oriented practice principles; and draw on educational and cognitive behavioral strategies (14, 62–64). Broadly, they aim to enable engagement in meaningful activities through a combination of educational, activity-based, group or individual sessions, and practice assignments related to engagement in real-world activities. Each uses a manual or participant workbook. They also each emphasize reflection on time use patterns as a means to develop understanding of health and well-being related aspects of activity engagement, and to bring about desired changes in activity patterns.

Action Over Inertia (AOI) (62, 63) was developed by Canadian occupational therapists as a person-centered, strengths-focused and flexible workbook-based approach for supporting individuals to construct activity patterns that enable fulfilling lives. The workbook provides resources, including time diaries, to support individuals to reflection on personal activity patterns and development of strategies for enabling rapid activity changes, supported planning for change, and ongoing supports for sustainable changes (65). More recently, AOI in group formats with 4-10 sessions have been described (63, 72). Integrating the AOI approach with a manualized vocational program, The Works (67), the Pathway to Participation (P2P) group program is designed to scaffold support for activity participation and build momentum for group members to engage in more complex and demanding occupations over time (64).

Balancing Everyday Life (BEL) (47) is a manualized group-based lifestyle intervention designed for people using community-based mental health services. Developed by Swedish occupational therapists, it aims to facilitate engagement in desired activities identified by participants and support for personal recovery (47). Of longer duration than AOI and P2P group programs, the BEL intervention consists of 14 group sessions over 16 weeks and addresses themes relevant to everyday life and personal recovery, including activity balance, meaning and motivation, healthy living, work-related activities, leisure and relaxation, and social activities (14, 66). Each BEL session includes an educational component, a group activity and a home assignment to try out preferred activities and strategies.

All ten studies reported the time use interventions were facilitated by at least one occupational therapist; only P2P groups were co-facilitated with peer or lived experience workers. All reported facilitator training and regular briefings (47, 64, 65).

3.4.2 Experiences and effectiveness of the time use interventions

All ten studies of time use interventions reported positive outcomes. The BEL has been evaluated in rigorous RCT studies that demonstrate it is effective in improving activity engagement, as represented in increased activity levels and more optimal activity balance, and improving personal recovery, clinical symptoms, psychosocial functioning and general quality of life (47, 68). Eklund et al. (47) also reported significant improvements in the control group in activity engagement, satisfaction with activities, symptoms, functioning and general quality of life. The authors suggest this may be attributed to the use of the POES as an outcome measure since it encourages reflection on current activity patterns and their impact on wellbeing, which may itself be a strong agent for change and promote activity engagement independent of the intervention.

A pilot RCT of AOI delivered individually over 12 weeks also showed small but not statistically significant activity changes: decreased time spent sleeping and increased general activity compared to a control group (65). The 10-week P2P group program was evaluated using a non-randomized, longitudinal study design. It too reported improvements in self-rated recovery scores and reduction of unmet needs through activity engagement, but no changes were detected in time use or psychosocial health measured using the Behavior and Symptom Identification Scale (BASIS-32) (64).

Five qualitative studies explored participants' and facilitators' experiences of the time use interventions; four of which related to the BEL (Table 4). Overall, participants reported the BEL program structure and content tailored to their skills and interests were helpful, along with opportunities to connect with peers and share life experiences in a supportive environment (69–71) This suggests connectedness and belonging were central to participants' experiences of the BEL intervention (70). The group components also encouraged reflection, envisioning and connecting to a more positive future, and sustaining change (69–71). However, participants suggested more flexibility to tailor the program to their needs, and more time and support for goal setting and implementing strategies in daily life would be helpful (71). The BEL group facilitators also perceived the program structure of the program as beneficial, along with its alignment to occupational therapy through activity engagement and promotion of collaboration within multidisciplinary teams (71). From their experience, the main barriers in implementing BEL were variation in individual needs and challenges, limited space or information technology issues (71).

Regarding AOI groups, Rees et al. (72) also reported participants' experiences of time use were changed by reconnecting with the value of meaningful activities and addressing barriers to sustaining activity engagement. The facilitators reported the concept of 'inertia', as conceptualized in the AOI, helped to identify restricted time use patterns and participation barriers as potential drivers for change. Rees et al. (72) also highlighted the value of peer learning and support when addressing time use, and recommended peer worker involvement in AOI group facilitation.

4 Discussion

This scoping review aimed to synthesize evidence addressing the review question: *'How does a time use perspective inform assessment and interventions in community mental health practice?'*

The findings identified applications of a time use perspective to develop methods of assessment, to measure the effectiveness of interventions, and as a basis for structured interventions in community mental health practice. Here considerations for their further use are discussed.

4.1 Time use assessment and outcome measures

Measuring time use is complex given the diversity of human activity and how multiple simultaneous activities or activities with intermittent interruptions occur across time (73). This review identified three approaches to time use assessment and evaluation currently being used: 1) measures collecting data at fixed intervals using pre-determined activity categories (e.g. TUS); 2) measures collecting data at fixed intervals with activities defined by people with severe mental illness themselves (e.g. POES); and 3) multiple daily spot sampling methods for capturing activity data in real time (e.g. ESM) (73, 74), as explored using smart phone technology (e.g. 41, 42).

Categorizing time use according to predetermined categories of activities has a long history in public health and social sciences for understanding human behavior in a temporal context; determining activity patterns and balance; identifying time use trends in structured or economically valued activity; and as an indicator of wellbeing or quality of life (4, 74). This approach is reflected in Time Use Survey (TUS) instruments, originally developed for population studies, and used to evaluate outcomes in six intervention studies identified in this review. These studies evaluated differing psychosocial and occupational interventions and indicate that the TUS is a relevant and sensitive measure, suitable for evaluating interventions designed to provide individualized support for activity engagement broadly or for participation in specific domains such as employment or socialization. The use of TUS offers advantages of well-understood language for reporting activity categories to enable communication of study results and comparability between studies (74). It also offers opportunities to consider the time use of people with severe mental illness in relation to that of the general population (74) and also specific groups within the general population (e.g. those not in the workforce, retirees, carers), as part of a more nuanced approach to analysis of activity patterns and disruptions (62, 63).

There are drawbacks to the application of TUS for time use assessment and evaluation in mental health practice. For instance, pre-determined activity categories have limited use to understand aspects of activity experiences, like their variety, meaningfulness, satisfaction and social aspects (e.g. where and with whom activities were undertaken). These aspects contribute to a holistic understanding of person's time use, including activity experiences within temporal and social contexts, that is necessary to illuminate the interacting biological, psychological and social forces in which many activity disruptions experienced by people with severe mental illness are situated (63). An alternative approach to time use assessment, such as the POES (36), focuses on activities as defined by people with severe mental illness themselves and is more able to evaluate a range of health and well-being aspects of activity engagement that are sensitive to the influence of complex factors like capacities, experiences, and the course of recovery (36, 37, 48, 51). In so doing, POES highlights the extent to which a person's activities are aligned with their values, capabilities and resources (14). As indicated by the studies in this review, this means POES is a useful tool for assessment and evaluating outcomes of importance to both personal recovery and community inclusion.

The time use assessments identified in this review also appear to be valuable and inexpensive tools for reflection on one's time use, health and well-being through activity, developing awareness of personal needs and issues, describing the frequency and experiences of related behaviors, identifying the impacts of symptoms, treatments and resources in daily life, and informing goal planning (36, 37, 39). However, further evidence of the potential of time use based reflective tools to support self-determination, and to enable individuals to self-monitor their time use in relation to health and wellbeing, as part of recovery oriented and self-management approaches needs development (75). With activity-related on-line information and resources, tracking devices and other applications continuing to advance, the ESM approaches are particularly well suited for integrating time use information into person-centered recovery-oriented care and self-management tools, such as the Wellness Recovery Action Plan (WRAP) (76). Yet, the needs of people with severe mental illness for sustainable and equitable access require further consideration to overcome the 'digital divide' posed by socioeconomic circumstances (77).

Some limitations of time diary-based assessments, such as POES (36) and the simplified time budget (39), should be noted. While they typically include a retrospective interview that offers opportunities for practitioners to explore perceptions of activity engagement and time use, difficulties related to recall may be more pronounced for individuals with severe mental illnesses due to cognitive issues, lack of daily prompts or routines, or issues related to reporting particular activities. The most recent version of Action over Inertia (63) prompts practitioners to consider unreported daily activities, such as work for informal payments, using or selling drugs, begging, and other forms of activities that may have personal value but can also adversely impact health and wellbeing. Spot sampling methods with multiple daily reminders (e.g. ESM) can overcome recall challenges and offers more flexibility in measuring activity duration (73, 74), but issues with low adherence and accuracy of responses over an extended period (over 5-6 days), technical difficulties with devices, and potential exacerbation of positive symptoms are also reported (20, 41, 42). These are important issues for which engaging lived experience and professional perspectives in co-designing solutions will benefit future developments.

4.2 Interventions

While daily time use is a highly personal experience, influenced by various factors embedded in larger environmental contexts (e.g. culture, income, neighborhood structures, family expectations), the interventions identified in this review explicate the knowledge base and standardized processes underlying practice for addressing health and well-being aspects of time use collaboratively with people with severe mental illness. They contribute to emerging evidence on interventions supporting personal recovery (78–80). The effectiveness and external validity of these intervention may be limited. For example, most studies reported small number of participants, issues with retention and work conducted in specific contexts (e.g. Swedish mental health services). The authors of the Randomized Control Trial studies acknowledged that lack of blinding may have also impacted the findings (14, 65).

Ongoing advancements in the field are leading to the inclusion of a broader range of factors that influence implementation of interventions in practice. The BEL, AOI and P2P interventions utilize either group or individual session formats that can be modified or adapted to individuals' needs and preferences. They also all include homework or activity experimentation based on personal goals, aligned with current knowledge regarding the transference of choices made in therapeutic settings to the real-world, including the importance of ongoing support, evaluation and adaptation (81). While peer learning and support were also identified as beneficial aspects of the group programs (70, 72), only P2P involved lived experience co-facilitators. Given emerging evidence that peer involvement in developing and delivering social interventions contributes to positive outcomes (82), this is an important avenue for further development of time use focused interventions.

Thinking ahead, the field may benefit from advancing and implementing conceptual frameworks to systematically link time use activity patterns with personal recovery, health and well-being for people with severe mental illness. This would ensure shared definitions, demonstrate the links between activity patterns and health and well-being, support the evidence base, and serve as a foundation for comparing measurement tools and intervention approaches. For example, the Do-Live-Well Framework (DLW) (83–85), a conceptual framework from Canada, identifies eight activity experiences and five activity patterns previously shown to impact health and well-being. Integrating such a framework in the mental health field depends on further study of its relevance to people with severe mental illness living in the community, such as aligning to their goals and preferences.

Ensuring that the complex factors influencing time use are systematically considered in intervention approaches depends on integrating theory and conceptual models into their design, as well as lived experience and professional perspectives. The International Classification of Functioning, Disability and Health (ICF, 86), recovery frameworks (80, 87, 88), and understandings of cognition and motivation provided the foundation of time use scholarship and practice in the mental health field. With the growing understanding of the social forces that marginalize or constrain activity participation for people with severe mental illness, these must be addressed in any intervention approach that purports to focus on supporting community inclusion and quality of life (89). Hence, the updated version of AOI (63) includes identification of transportation, stigma, discrimination and personal safety related barriers. However, to consider environmental, social and other contextual factors more seriously, other theories and perspectives are needed. For example, perspectives such as Occupational Justice (90) and the Capabilities Framework (91, 92) ground an understanding of what people can do and be in the structural and contextual conditions that support or restrict possibilities for doing, and thereby could locate time use scholarship and practice in the realm of social justice.

4.3 Limitations

This scoping review focused on applications of a time use perspective in community mental health practice involving people with severe mental illness. Hence, the reviewed time use measures and interventions may not be applicable to other populations or in inpatient settings. Since the time use studies of people with mood or anxiety disorders and/or high prevalence mental illness were excluded from this scoping review, these warrant further exploration (93). Most reviewed studies were conducted in North America, Europe or Australia, so that the findings may not be generalizable to other cultural or geographical contexts. The heterogeneity of study methodologies, limited longitudinal data and flexibility of intervention formats and delivery were barriers to consolidating this evidence and commenting on the sustained impact of interventions. Inclusion of stakeholder consultation is recommended to enhance methodological rigor (32). While this scoping review was informed by a team with perspectives as researchers, educators and mental health clinicians, consultation with other stakeholders, such as people with severe mental illness or peer workers in mental health services may have enhanced synthesis of this research.

5 Conclusions

This scoping review described practice applications of a time use perspective in community mental health practice. It identified time use assessments that evaluate outcomes of importance to personal recovery and community inclusion; and time use interventions designed to address activity patterns associated with poor health and well-being. These approaches emphasize reflection, collaborative goal planning and supported activity engagement, and contribute to emerging evidence on interventions that support self-management and personal recovery. While most time use assessments and interventions originate in occupational therapy, other mental health disciplines have begun to measure time use as a means to evaluate psychosocial intervention outcomes. This is an important step in raising the profile of time use perspectives across the mental health field and integrating time use approaches into evidence informed practices within community mental health services.

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.

Author contributions

EF: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. ND: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. CH: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Formal analysis, Conceptualization. CD: Writing – review & editing, Visualization, Validation, Formal analysis, Conceptualization. DH: Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. LF: Writing – review & editing, Visualization, Validation, Methodology, Formal analysis, Conceptualization. TK: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Formal analysis, Conceptualization.

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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.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2024.1461705/full#supplementary-material

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Acceptability and exploratory effects of an occupational therapy intervention to improve recovery and return to work of workers with mental health disorders in primary care: a mixed methods study protocol

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Background: People with common mental disorders (CMD) are prone to experience work disabilities, which can lead to sick leave. To support their recovery and return to work, evidence recommends providing a combination of primary care services including psychological and work rehabilitation interventions. Furthermore, interventions to coordinate return to work are required to ensure timely access to services and concerted action among stakeholders. Occupational therapists are qualified to provide these interventions and to facilitate sick leave management. However, current medical practices, lack of collaboration among stakeholders, and lack of occupational therapists working within family medicine groups create highly variable care pathways and delays in access to appropriate services.

Aim: This study aims to evaluate the acceptability and explore the effects of an occupational therapist-led program integrated within family medicine groups designed to improve the management of CMD-related sick leave and promote patients' recovery and sustainable return to work in the Canadian province of Québec.

Methods: This study will consist of a mixed methods multiple case study design. It will also use a participatory research approach, actively engaging family medicine group team members and patient partners throughout the study. The occupational therapy program will include three components: 1) consultation for prevention of sick leave and support for return-to-work decisions, 2) coordination of recovery and return-to-work services, and 3) provision of recovery and work rehabilitation services adapted to each patient's needs. Questionnaires, interviews, and focus groups will be used to collect data on the eight dimensions of the acceptability model described by Sekhon et al. and to measure pre- and post-outcomes to assess the effects of the occupational therapy program. Data will be analyzed using the Framework Method and repeated measures statistical analysis.

Discussion: We expect that the provision of this innovative occupational therapy program will improve patients' outcomes and the service trajectory of people with CMD. This study will document how to enhance interprofessional collaboration within family medicine groups and to ensure equitable access to work rehabilitation services for all patients, thereby improving recovery and healthy sustainable return-to-work.

KEYWORDS

primary care, common mental disorders, occupational therapy, return to work coordination, acceptability, implementation

1 Introduction

Approximately half of the world's population will experience a mental disorder affecting their day-to-day functioning and quality of life during their lifetime (1). These disorders affect work capacity and are leading causes of presenteeism, absenteeism, and staff turnover (2). This situation contributes to significant societal and economic costs worldwide. For example, in Canada, half a million workers will be absent from work each week due to a mental disorder (3) and 20% of those with a common mental disorder (CMD) will experience prolonged work disability (4, 5). People experiencing prolonged sick leave are at greater risk of relapse and present reduced chances of recovery and return-to-work (RTW) (6). In Canada, it is estimated that mental disorders incur an annual cost of over $50 billion, of which between $6 billion and $19 billion can be attributed to lost productivity related to absenteeism, presenteeism, and permanent withdrawal from the job market (7).

In this context, the need for efficient and accessible mental health services is undeniable (8). Yet, according to the World Health Organization, mental health systems and services around the world remain inaccessible or poorly adapted to meet these needs (8). This problem persists despite clear evidence on sick leave management for people with CMDs. Evidence shows that people who are on CMD-related sick leave benefit from interventions provided by an interdisciplinary team. These interventions should combine pharmaceutical, psychological, and work rehabilitation interventions to improve their recovery and their healthy and sustainable RTW (2, 9–14). Clinical approaches, such as cognitive-behavioral therapy, should be combined with work-focused interventions, such as work tasks and work environment modifications, as psychological interventions alone were found to be insufficient to support a healthy and sustainable RTW (2, 15). These interventions should be offered to the individual promptly and in collaboration with the stakeholders involved which includes but is not limited to the patient, the healthcare professionals, the employer, and, when appropriate, the insurer (2, 11, 16–19). Furthermore, these interventions should be delivered within a recovery-oriented approach to care to ensure that patients' goals, choices, and strengths are respected and promoted throughout their recovery and RTW process (8, 20). Ultimately, to optimize the support provided during sick leave, it is imperative to facilitate timely access to services aligned with the best evidence (8).

Primary care settings are typically the gateway to mental health care and services. In Canada, family physicians and specialized nurse practitioners (SNP) are responsible for prescribing and managing sick leaves related to CMD. This role entails coordination of referrals to appropriate health services and ensuring timely communication with the insurer and employer. In the Canadian province of Québec, to facilitate close interprofessional collaboration, family physicians and SNPs often work in family medicine groups (FMG) alongside a variety of other professionals. However, growing literature supports that family physicians feel ill-equipped and lack the time to take on this role, which influences the care pathways of patients with CMD and contributes to delaying access to the required psychosocial and work rehabilitation services (18, 21–23).

Several studies have demonstrated that RTW coordinators play a pivotal role in improving recovery, and timely and sustainable RTW (16, 17, 24). With knowledge of existing services and organizational procedures, the RTW coordinator's role is centered on ensuring collaboration and mutual understanding of each stakeholder's role and expectations as well as facilitating coordinated actions among them. Accordingly, they provide support to the worker in identifying their needs in terms of services to ensure recovery and sustainable RTW (25). In Quebec, RTW coordinators are often employed by employers or insurers and can be seen by workers as being in a position of conflict of interest, which can limit the impact of their interventions and the trust that workers on sick leave have in their interventions (16, 18). To offer neutral support, it is recommended that RTW coordinators should be in an independent position within the healthcare system (26). However, only a few studies have evaluated the implementation of this type of intervention in a primary care setting for people with CMD. One of these studies is being conducted in Germany and aims to demonstrate the effectiveness of an interprofessional team program that focuses on co-orientation, coordination, and cooperation to promote sustainable RTW (27). Three intervention modules are offered to support patients and to act on RTW facilitators and obstacles, develop work capacities, and prevent and manage relapses. Another set of studies evaluated different components and perspectives of the mandatory integration of RTW coordinator in the Swedish primary healthcare system since 2020 (28–30). Results published until now describe facilitators and obstacles to the coordination of RTW in primary care and to the collaboration of RTW coordinator with family physicians and employers (28, 30, 31). Facilitators identified include achieving open dialogue and common goals between primary care workers and insurer and employer representatives, establishing common value systems towards intersectoral collaboration within the primary care team and ensuring collegiality between RTW coordinators (31). Barriers identified include variability in workplace resources and RTW conditions, unclear definition of the coordination role and lack of coordination training (31). They also describe that the RTW coordinator's intervention in primary care provides the worker, the family physician, and the employer with insight on how to address difficulties in supporting the person's recovery and RTW process (28, 30).

Since RTW coordinator's skills include assessing the person's capacities and identifying the daily and work tasks that suit these capacities, previous research has demonstrated that occupational therapists are one of the best-equipped professionals to intervene as RTW coordinator (16). Their training ensures that they acquire the competencies and skills necessary for coordinating and providing RTW interventions for people with CMD (26, 29, 32). In the context of sick leave, occupational therapists have the skills to provide interventions to support recovery, assess and improve the functional capacities and modifications to the work environment, such as adequate work accommodations, to support, in collaboration with the employer, sustainable RTW (33). However, recent Canadian studies on the integration of occupational therapists into primary care found that referrals to occupational therapy services are still uncommon, largely due to limited understanding of their role by primary care physicians and professionals, and because of various contextual barriers (34, 35). Moreover, while the number of studies on occupational therapists' role in primary care has been increasing, there remain few that study the interventions directly in a specific primary care clinical setting (35).

1.1 Study objectives

In this context, the overall aim of this study is to evaluate the acceptability and explore the effects of an occupational therapist-led program, integrated within FMG in the Canadian province of Québec, that is designed to improve the management of CMD-related sick leave and promote service workers' recovery and sustainable RTW.

We will describe the perspectives of 1) patients receiving the intervention, 2) occupational therapists providing it, and 3) FMG teams collaborating on its delivery on the acceptability of implementing an occupational therapy-led program in FMG. The effect this program has on the recovery and RTW outcomes of people with a CMD will be evaluated.

2 Methods and analysis

2.1 Conceptual frameworks

Two conceptual frameworks will be used in this study. The first one is the Theoretical Framework of Acceptability (TFA) developed by Sekhon and collaborators (36). This framework defines acceptability in terms of seven components described in Table 1. It helps to identify the barriers perceived by patients that can limit the implementation of an intervention in a given context. The TFA describes that acceptability can be assessed at three time points: 1) prospective acceptability, which allows for assessment of anticipated acceptability; 2) concurrent acceptability, which is assessed whilst participating in the intervention; and 3) retrospective acceptability, which is the assessment of experienced acceptability. In the current study, acceptability will therefore be assessed at three times: 1) before the implementation of the intervention (pre-implementation) to identify factors likely to influence implementation and acceptability (*prospective acceptability*); 2) during the intervention, to identify these factors as they arise (*concurrent acceptability*); and 3) after the intervention is implemented (post-implementation), to document the experience patients had of the intervention (*retrospective acceptability*) (36).

The second framework is the revised version of the Consolidated Framework for Implementation Research (CFIR) (37). The CFIR has been frequently used in implementation research to document contextual facilitators and barriers

TABLE 1 Components of the Theoretical Framework of Acceptability (TFA) (1).

Components	Definitions
Affective Attitudes	Feelings of the person regarding the intervention.
Burden	The amount of effort perceived to be needed to engage in the intervention.
Ethicality	The degree to which the intervention aligns with a person's value system.
Intervention coherence	The level of understanding of the person regarding the interventions and its functioning.
Opportunity Costs	The degree to which benefits, profits, or values are forfeited to engage in the intervention.
Perceived Effectiveness	The perceived potential of the intervention to meet its goals.
Self-efficacy	The person's belief in their capability to carry out the actions needed for the intervention.

influencing the implementation of innovations (37). It includes 48 constructs and 19 subconstructs grouped into five domains (i.e., innovation, outer setting, inner setting, individuals, and implementation process). It will be used in this study to document elements of the context (other than those related to the intervention domain included in the TFA) that could influence the implementation of the occupational therapy program and will guide the development of the interview guides. For example, these elements could be related to the inner setting domain such as work organization of tasks, relational connections, communication, tension for change or relative priority for change. They could also be related to the individual domain (e.g., knowledge, skills, leadership and motivation of members of the healthcare team) and the implementation process domain (e.g., teamwork between all stakeholders involved, planning of roles and responsibilities, implementation strategies used).

2.2 Study design

A mixed methods multiple case study research design will be used (38). Case study is a naturalistic research approach that allows to explain and explore a phenomenon in its context (38), in this case, the implementation of an occupational therapy program in a new environment that is the FMG. This research approach will provide an in-depth understanding of the perspective of those who deliver the intervention in an FMG context, as well as those who receive it. It will also document the elements of the intervention and the context on which action must be taken to optimize its effects (39).

To achieve an in-depth understanding of the acceptability and explore the effects of each case, the present study will use a mixed methods case study design with a convergent design (40). For the acceptability assessment objective, the quantitative and qualitative components of this study will document the evolution of acceptability from the pre-implementation phase to the post-implementation phase and evaluate the similarities and differences between the perceptions of the various stakeholders, including health care professionals, insurers, employers, union representative.

To explore the effects of the occupational therapy program, a pre-test/post-test research design without a control group will be used. Quantitative data will be collected to measure the changes produced by the intervention on the patient's recovery and RTW outcomes. The qualitative component will explore the patient's perceived outcomes of the program in more depth.

This study is also rooted in a participatory research and integrated knowledge translation approach, which includes collaborators and important actors as members of the research team (41, 42). Our research team is composed of researchers, patient partners and occupational therapists. Partnerships with the clinical settings and managers were established at the start of the study planning to ensure the objectives of the study met the needs of their patients and of the clinical teams. They were involved in the development of the protocol and the data collection procedures. Their planned implication in each stage of the study has been documented throughout the methodology below. Furthermore, for each case, an implementation support committee, composed of members of the research team, of members of the FMG, and of patient partners will also be set up to support key project decisions, the interpretation of study findings, and participate in the knowledge mobilization activities. They will meet three to four times a year, as required, throughout the study period.

2.3 Case descriptions

The cases in this study are three university family medicine groups (U-FMG) recruited on a voluntary basis. In Québec, U-FMGs are family medicine groups that have an added academic component requiring implication in research activities and training of residents in family medicine, students, and interns in various disciplines. They are typically composed of family physicians, SNPs, nurses, social workers, pharmacists, and allied health professionals chosen by the clinic managers. Therefore, each case includes: 1) the patients, 2) the U-FMG teams (i.e., family physicians, SNPs, allied health professionals and clinic managers), and 3) the occupational therapists who will deliver the intervention.

The three U-FMGs are each in a different urban area and one of them also serves a rural population, allowing us to explore the influence of different factors such as access to psychosocial work rehabilitation services, which may be more limited in rural areas. Regional variability can allow diversity in the types of jobs held by patients and work settings, which may influence the RTW and recovery process and outcomes (43).

2.4 Occupational therapists and U-FMG team members trainings

Each U-FMG will have a full-time occupational therapist. During the pre-implementation phase, they will follow a continuing education program to make sure they provide services based on the most recent research evidence. This training will serve to refresh and update knowledge and skills on the principles of the recovery-oriented approach and the therapeutic RTW approach for CMD (44). The content of the pre-implementation continuing education program that will be offered to the occupational therapists is presented in Supplementary Table 1.

The occupational therapists will be mentored by two expert occupational therapists currently providing work rehabilitation interventions for people with CMD and continuing education in work rehabilitation for occupational therapists. They will also benefit from exchange platforms with each other to promote collegiality. These conditions have been put in place to provide sufficient support to these occupational therapists while they integrate independently a new practice context that has no or limited experience in collaborating with occupational therapists and RTW coordination.

Before the recruitment of participants, the three participating U-FMG team members will also receive training on the role of occupational therapists for patients with CMDs and on RTW coordinator. The training will last two hours. It will clarify patient referral criteria and processes, the services the occupational therapist can offer, the shared roles between health care professionals, and the collaboration and communication tools to be used between team members (e.g., referral form, use of electronic medical record, insurance forms). It will also promote the use of a common recovery perspective among all members of the U-FMG team. Previous experiences integrating a new professional into FMGs demonstrated the importance of understanding and communicating one's role to collaborate effectively with teams (34, 45, 46).

2.5 Description of the intervention

The occupational therapy program consists of three components based on the best current recommendations for the management of workers with CMD, namely 1) a consultation/prevention component, 2) a recovery and RTW coordination services component, and 3) a support in recovery and work rehabilitation component (11, 15, 33, 47). As planned in the program, family physicians will be asked to refer their patients to the occupational therapist in two distinct situations: 1) if they are questioning the appropriateness of prescribing a CMD-related sick leave, or 2) if they have prescribed sick leave. Occupational therapists will then determine which components of the program they will offer to the referred patients according to their situation and their needs (i.e. characteristics of their condition, insurance coverage, and work situation). A description of the intervention according to the TIDieR checklist is presented in Table 2 (48).

2.6 Patient recruitment strategy

For recruitment purposes, physicians and SNPs will be asked to identify patients with a diagnosis of CMD for whom a decision of sick leave has been made or may be considered. These patients will be referred to the occupational therapist. If they agree to participate in the study, a member of the research team will meet them to verify their eligibility, and to obtain their informed consent to participate in the study. Recruitment will take place over 12 months in each U-FMG.

To be eligible patients must be: 1) consulting a family physician or a SNP for a CMD, 2) referred to the occupational therapist for a new episode of sick leave or wish to prevent a sick leave, and 3) able to speak, read, and understand French or English. In this study, CMDs include depressive disorders, anxiety disorders, obsessive-compulsive disorder, and trauma- or stress-related disorders, including adjustment disorders (49). Patients will not be eligible if they: 1) have a diagnosis of a severe mental disorder limiting work integration or participation and 2) require or receive services from a specialized mental health care team.

2.7 Data collection

2.7.1 U-FMG and participants' characteristics

2.7.1.1 Case study characteristics

To provide a rich description of the study context, the following information on each U-FMG will be collected: number of registered patients, physicians, other professionals, and available resources (e.g., electronic medical record). Managers of the U-FMG will be consulted and local data will be used to collect this information. Qualitative data on the characteristics of the U-FMG's will also be collected in a focus group using a semi-structured interview guide based on the CFIR domains and constructs.

2.7.1.2 Patients' sociodemographic characteristics and RTW related factors

Data will also be collected to describe the patients who received the occupational therapy program. An online questionnaire will be administered at the time of recruitment to document the following patient characteristics: gender, sex, age, race/ethnicity, education level, marital status, employment status, type of employment, household income, diagnosis, number of previous sick leave episodes and their duration, reasons for sick leave, type of insurance coverage, number of days absent from work, number of hours worked per week if partial sick leave, type and sector of employment, and company size. Source of referral (either the family physician or the SNP) will also be documented, whether the patient is or not registered with this professional, and since when.

2.7.2 Characteristics of health care and social services received by patients

2.7.2.1 Description of the occupational therapy interventions received

To document how occupational therapy interventions are implemented in the three U-FMGs, each occupational therapist will fill out a logbook for each patient describing frequency, duration, types, and modality of the interventions provided.

TABLE 2 Description of the occupational therapy program based on TIDieR (48).

Item	Description
Brief name	Primary care-based occupational therapy program for recovery and RTW – CMD
WHY (rationale of intervention)	1. Support family physician or SNP decision-making process concerning sick leave and RTW, 2. Coordinate the services required by the patient within the U-FMG and externally, 3. Facilitate patient recovery and RTW.
WHAT (material & procedures)	Component 1 - Consultation/prevention - Assessment of the impact of CMD on the patient's daily life and work capacities. - Identification of factors contributing to the patient's functional disabilities. - Support clinical decision-making process of family physicians and SNPs regarding sick leave and RTW (33, 44). - Recommendations to the patient and the employer to adapt work tasks or modify characteristics of the work environment (33). Component 2 - Coordination of recovery and RTW services - Coordination of services required to promote the patient's recovery and RTW (RTW coordinator's role) (25, 44). - Assessment of the patient's needs and resources (e.g. insurance coverage) - Referral to the right professionals. - Communication, with the patient's consent, with other professionals, the insurer, and the employer to foster concerted actions between stakeholders. RTW. Component 3 - Support in recovery and work rehabilitation *If the patient does not have access to work rehabilitation services outside of the U-FMG.* Offer interventions as described in the Therapeutic RTW program, including one or multiple of these phases: - Diagnosis of work disability: Using comprehensive assessment tools to assess the person's current situation (e.g., *Work Disability Diagnosis Interview* (WoDDI)). - Preparation to work phase: improvement of quality of life and work prerequisite. - RTW phase: progressive development of work capacities and work adaptations in the real work environment. - Maintenance at work phase: assist the person in transferring knowledge in the real work environment and offer RTW support.
WHO PROVIDED (intervention provider and training)	Occupational therapist working within the U-FMG in collaboration with an interdisciplinary team and stakeholders. This occupational therapist will have received the training described in Supplementary Material 1. Family physicians and SNPs of the U-FMG referring patients to the occupational therapist.
HOW (modes of delivery)	The occupational therapist intervention is delivered using a recovery-oriented approach and is tailored to the patient's preferences and needs, as well as to the needs of the intervention.
WHERE (infrastructure and relevant feature)	Interventions can be provided by teleconsultation or in-person at the clinic, or the workplace, depending on the patients' needs and preferences.
WHEN AND HOW MUCH (number of sessions, duration, intensity)	Patients will be referred to the occupational therapist as soon as possible to prevent sick leave or ensure appropriate RTW coordinator support and referrals to external resources. Interventions may vary depending on whether the patient has access or not to occupational therapy services in the private system. If occupational rehabilitation services are offered by the U-FMG, we expect a one-hour appointment per week for two to up-to 16 weeks, depending on the patient's health and needs, as well as the characteristics of his or her job and work environment.
TAILORING (personnalization)	The intervention will be tailored to the patients' needs and insurance coverage. It may therefore vary in terms of intensity of follow-up and duration. Patients will be referred to private services when they have access to them, and the occupational therapist will act primarily as a RTW coordinator in this situation. For patients who do not have access to private services, the intensity of interventions will be greater to provide psychosocial support and work rehabilitation services RTW.
HOW WELL (planned)	Occupational therapists will receive training before the study begins and mentorship will be offered to ensure that the interventions offered are delivered in respect of the recovery-oriented approach and the therapeutic RTW approach for CMD. U-FMG teams will also receive training on the role of the occupational therapist.

Furthermore, information on stakeholders' involvement, and on collaboration with other U-FMG team members, external professionals, and stakeholders will also be collected.

2.7.2.2 Description of other health and social services used by patients

We will also document information on other health and social services accessed and used by the patient (e.g., psychologist, Employee and Family Assistance Program, private occupational therapy, etc.) via a self-administered questionnaire completed at the end of the study to evaluate the possible influence of accessing those resources.

2.7.3 Assessing the acceptability of the occupational therapy program (objective 1)

Acceptability of the intervention will be assessed in three phases: pre-implementation, during implementation, and post-implementation (Table 3).

2.7.3.1 Pre-implementation acceptability

Two strategies will be used to document pre-implementation acceptability: TFA questionnaire and a focus group in each participating U-FMG.

The TFA questionnaire will be completed by U-FMG team members, occupational therapists, and patients at the time of

TABLE 3 Accessibility assessment data collection according to study frameworks and implementation phase.

Data collection methods	TFA	CFIR	Pre-implementation	During implementation	Post-implementation
TFA questionnaire *	X		X		X
Focus Groups**	X	X	X		X
Minutes from implementation support committee meetings**	X	X		X	
Research coordinator and occupational therapist logbook**	X	X		X	
Emails between research team and implementation support committee **	X	X		X	
Semi-structured interview with occupational therapists**	X	X			X
Semi-structured interview with patients**	X				X

*Quantitative data collection; **Qualitative data collection.

recruitment. It is an 8-item generic questionnaire assessing the seven components of acceptability. It can be adapted for any intervention (50). Each item is scored on a five-level Likert scale which allows to produce a score from 8 to 40, 40 being the highest level of acceptability. It was developed using participatory methods and is based on Sekhon et al. (36) theoretical framework. For the purpose of our study, it will be adapted to the context of the occupational therapy program with the support of our research team, which includes our patient partners, a family physician and occupational therapists. It will also be translated into French using online translation tools and validated through the consultation of our research team. Pretest of the questionnaire will be conducted with five patients, healthcare professionals and occupational therapists not participating in the study to ensure clarity of items.

The pre-implementation focus group will be conducted in each U-FMG to understand team members' expectations related to the implementation of the program. The focus groups will involve 9 participants, including physicians and SNPs (n=4), U-FMG managers (n=3), a nurse (n=l), and a social worker (n=1). An interview guide based, on the TFA model by Sekhon et al. (36), will be used to document expectations, needs, readiness to change, perceived sense of control, and contextual elements that could facilitate or hinder the implementation of the intervention according to each of the model's domains. The group will be facilitated by a member of the research team and a patient partner. This data will be used to adapt the occupational therapy program according to the characteristics of the U-FMG context (e.g., team functioning, modes of communication, sharing of roles between team members).

2.7.3.2 Acceptability during implementation

At each U-FMG, an implementation support committee will be set up to ensure effective coordination of the implementation and data collection processes. Meetings of the implementation support committee will be recorded, and minutes of each meeting will be produced. Moreover, elements facilitating or hindering the implementation of the occupational therapy program will be documented. The research coordinator will keep a logbook describing the steps taken each week (highlights from emails, phone calls, or meetings). Occupational therapists will also keep a logbook to document their perceptions of challenges or successes in implementing interventions and collaborating with other U-FMG professionals. E-mail exchanges between members of the research team and members of the implementation support committee will also be analyzed to document collaboration.

2.7.3.3 Post-implementation acceptability

Three strategies will be used to document post-implementation acceptability: TFA questionnaire, semi-structured interviews, and focus groups.

The TFA questionnaire will be completed a second time, at the end of the implementation phase, by the U-FMG team members and the occupational therapists to compare pre- and post-implementation acceptability results. To document the perspective of physicians and SNPs who would not have referred patients to the occupational therapist, an additional open-ended question will be added to document the reasons associated with these practices. Patients who will have received the occupational therapy program will also complete the TFA questionnaire at the time of discharge in occupational therapy for post-implementation assessment.

Semi-structured interviews will be conducted with ten to 15 participating patients from each of the U-FMGs. A maximum variation purposeful sampling strategy will be used to recruit patients with different characteristics within the sample of subjects who received the intervention (51). We will recruit patients in consideration of their gender, age, level of education, socio-economic level and whether or not they had access to private insurance. Patients who had previously experienced a sick leave related to a CMD will also be recruited to compare their experiences in terms of access to services and perceived effects. The interview guide will be developed based on the TFA model. Semi-structured interviews are expected to last between 30 and 60 minutes and will be conducted via a web conference platform.

Interviews will also be conducted with the participating occupational therapists, using an interview guide based on the

TFA model and the CFIR to document the occupational therapists' perspective on the acceptability of their interventions and the contextual factors that influenced the acceptability of the program. They will also be asked to comment on the future, larger-scale implementation of the program in other U-FMGs or FMGs. Semi-structured interviews will last approximately 60 minutes and will also be conducted via a web conference platform.

We will also conduct a focus group with each of the U-FMG teams. The group will be composed of approximately nine participants, including physicians and SNPs (n=4), U-FMG managers (n=3), a nurse (n=l) and a social worker (n=1). An interview guide also based on the TFA model and CFIR framework will be used. The group will be facilitated by a member of the research team and a patient partner. Table 3 summarizes the data collection methods planned at each phase for the accessibility assessment.

2.7.4 Exploratory evaluation of the effects of the occupational therapy program (objective 2)

Data collection on the exploratory effects of the occupational therapy program on recovery and RTW will be carried out at baseline, at discharge, and at 6 months follow-up.

2.7.4.1 Effects on recovery

To explore the effects of interventions on patient recovery, we will assess depressive and anxiety symptoms, perceived health-related quality of life, occupational balance and personal recovery using the following five questionnaires:

2.7.4.2 Patient health questionnaire-9

This questionnaire will be used to assess the intensity of depressive symptoms (52). The PHQ-9 has adequate reliability, excellent discriminant and convergent validity, and a robust structure factor (52, 53).

2.7.4.3 General anxiety disorder

This questionnaire will be used to measure the intensity of anxiety symptoms (54). The GAD-7 has excellent sensitivity, specificity, convergent validity and internal consistency, enabling it to be a good screening tool for anxiety symptoms (55, 56).

According to guidelines provided by the Quebec Ministry of Health and Social Services (57) for mental disorder, the GAD-7 and PHQ-9 should be administered when symptoms associated with frequent mental disorders in adults are present.

2.7.4.4 Short-Form 12

The Short-Form 12 (SF-12) will be used to measure self-perceived health-related quality of life and includes eight domains assessing physical and mental health (58, 59). The SF-12 is an adapted version of the SF-36, whose validity, test-retest reliability and responsiveness to change have been repeatedly demonstrated in the literature (60, 61). This test has also been validated to assess health-related quality of life in cohorts with mental health conditions (62).

2.7.4.5 Occupational Balance Questionnaire

The Occupational Balance Questionnaire will be used to document the person's level of life balance, i.e., the extent to which a person achieves a good quantity and variation of occupations. The score of this questionnaire is strongly correlated with perceived health (63, 64). The original version demonstrates a good internal consistency, and satisfactory test-retest reliability (63). The French-language version of this questionnaire demonstrated good internal consistency and satisfactory test-retest reliability in Quebec (64).

2.7.4.6 Brief INSPIRE-O

The Brief INSPIRE-O is an adapted version of the Brief INSPIRE designed to assess personal recovery outcomes. It is a five-item self-reported outcome measure based on the CHIME framework for recovery (65). Each item is meant to assess one of the five processes described by the CHIME framework: Connectedness, Hope and optimism, Identity, Meaning and purpose, and Empowerment (66, 67). Its validation demonstrated good scalability, satisfactory internal consistency, and moderate test-retest reliability (65).

2.7.4.7 Effects on RTW

Effects on RTW will be assessed by documenting work status at discharge and at six months follow up using a validated grid (68), job type, and self-reported duration of absence from work. In addition, two questionnaires will be used to document perceived RTW self-efficacy and work functioning at baseline, at discharge and at six month follow up.

2.7.4.8 RTW self-efficacy questionnaire

The RTW self-efficacy questionnaire (RTW-SE) will be used to evaluate RTW self-efficacy. The original English version of the RTW-SE has excellent internal reliability, adequate test-retest reliability and good sensitivity to change, and is identified in the literature as having predictive validity for RTW (69, 70). The French-language version was translated in a two-stage process by the Institut de recherche Robert-Sauvé en santé et sécurité du travail (71).

2.7.4.9 Work Role Functioning Questionnaire

We will use the Work Role Functioning Questionnaire (WRFQ) to evaluate work functioning, the extent to which an induvial feels able to meet the physical, mental, and social demands of the job (72, 73) The Canadian French version of the WRFQ has good content validity, very good internal consistency for all items except the social demands scale, and good construct validity (72, 74).

2.8 Analysis

The Framework Method will be used to analyze the data associated with each objective. It is an analytical method suitable for multiple case studies, mixed research designs, and for managing large amounts of data (75). The seven steps of the method will be used for each case: 1) transcription of the data, 2) familiarization with the data, 3) coding, 4) development of an analytical framework, 5) application of the analytical framework, 6) classification of the data in the analytical matrix, and 7) interpretation of the data. All qualitative and quantitative data will be integrated into the NVivo 14 analysis software to create the results matrix. To contextualize the data for each case, the contextual data will be analyzed using the CFIR domains and constructs to create a portrait of each study site (37). The results of the analysis will be discussed with the research team members.

2.8.1 Objective 1 - acceptability assessment

Data collected for pre-implementation, during implementation and post-implementation assessment will be analyzed separately using a combined deductive and inductive thematic analysis approach (75, 76). Data will be organized to document each of the TFA domains. Two members of the research team will iteratively cross-code the data, reviewing the analyses performed for each case on an alternating basis to improve the intersubjective traceability of the coding.

Quantitative data collected using the TFA questionnaire will be analyzed using descriptive statistics, and differences between pre- and post-implementation results will be assessed with a paired t-test (or Wilcoxon signed ranks test if data are not normally distributed) using SPSS 29 software.

The results of the quantitative and qualitative analyses of acceptability will be reported into a joint display table to compare them for each of the components of the TFA model and will consider the different levels of analysis, i.e. acceptability at the U-FMG level, for the different professionals and for the patients (77). The results matrices produced for each case will then be compared (cross-case analysis) to analyze the influence of context variables on levels of acceptability pre-, during and post-implementation of interventions (38).

2.8.2 Objective 2 - exploratory evaluation of effects

Quantitative data on recovery and RTW will first be analyzed for each case independently, to document the effects produced by the intervention program by comparing the results obtained at baseline, discharge, and six months after the end of the interventions. Depending on the nature of the data, either parametric (ANOVA) or non-parametric (Friedman test) repeated measures statistics will be used. Analysis evaluating the differences between the results obtained for patients from the three U-FMGs will also be carried out using SPSS 29 software.

2.9 Trustworthiness

Strategies will be used by our team to ensure the trustworthiness of our findings. The study will allow the research team to have a prolonged engagement with each site helping them to achieve a nuanced insight of the phenomenon under study. A research journal will be kept by the research coordinator and the occupational therapists providing the intervention to document factors influencing the acceptability and implementation of the intervention. As described previously, we will use triangulation to collect various sources of data from multiple stakeholders. We will also thoroughly document the research process and decisions made by the research team and the implementation support committees of each research site. Debriefing with the research team will be performed regularly throughout the study. In-person group meetings will be conducted at the time of final data analysis for results validation. Results will also be presented at each research site to improve confirmability of findings. Transferability will be ensured by the thorough description of the research context, participants and also by collecting data on the perspectives of stakeholders in regard to the possible implementation of the program in other U-FMGs and FMGs in the province of Quebec.

3 Discussion

Over the past 20 years, evidence on how to best manage sick leaves associated to CMDs has been accumulating (2, 13–15, 44). Literature also describes the challenges preventing the implementation of these recommendations in practices in the Canadian context such as the lack of access to care and management from primary care providers (21, 22). The present study proposes a solution to put evidence on the management of sick leaves for patients' CMDs into practice and contribute to transforming primary care for the benefit of patients. Considering the complexity of mental health sick leave managements, the need to follow a thorough development process is undeniable. Following the Medical Research Council's Framework for the development and evaluation of complex interventions (78), this protocol illustrates even if this type of intervention has been previously described in the literature, it has not yet been tested in the specific and unique context of primary care. In that situation, the next phase of the development of knowledge on this kind of intervention relies in understanding how it should be adapted and how it is acceptable for patients, professionals and managers in this new delivery context It will also allow our team to assess the feasibility of the research methodology to prepare the conduct of a future experimental study if results from this study are promising.

3.1 Potential challenges and strategies to mitigate the risk

Some challenges and limitations to this study must be acknowledged. First, it will be important to have the collaboration of the family physicians and SNPs to refer patients to the new occupational therapists integrating their team. It will also be important that they have a good understanding of the occupational therapist's role. Training and close monitoring of these factors in the U-FMGs will be important. On the other hand, it is possible that the occupational therapist will receive too many referrals. Should this occur, a waiting list will be created. It is expected that the intervention will be delivered in a timely matter to the participants and problem-solving strategies will be used to identify how to improve appropriate referrals and avoid delays in treatment. The participatory research approach will support the engagement of U-FMG managers and professionals, patient partners and the research team in the problem-solving process. Furthermore, given that the U-FMGs (cases) were selected, in large part, due to their interest towards improving CMD care and services, the level of acceptability of those clinics could potentially be higher than those of other FMGs. The use of a mixed methods multiple case study will provide an in-depth understanding of these three cases from three different regions and a better understanding of how contextual factors influence the acceptability of this type of intervention Transferability may be limited since the project will be conducted in the province of Quebec. The results will be transferable to countries with healthcare coverage similar to Canada's, i.e. universal healthcare coverage. Given the exploratory nature of the intervention effects, the generalizability of this part of the results will be limited. Finally, while beyond the scope of this study, it will be relevant and important to assess the cost-effectiveness of this intervention to determine if scaling-up should be promoted and how it can support changes to insurance coverage and wider provision of public services.

4 Conclusion

This study will allow further clarification and promotion of the importance of integrating occupational therapists into primary care to enhance the quality of care and services offered to the mental health population. This exploratory study on the acceptability and effects is the first step towards designing and conducting a randomized controlled trial and an economic evaluation to test the effectiveness and cost-effectiveness of implementing the intervention in a primary care clinical setting.

Ethics statement

This project has undergone institutional review board (IRB) and has received approval from the ethics committee of the Centre de services intégrés universitaires de santé et services sociaux de l'Est-de-l'Île-de-Montréal.

Author contributions

JL: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. QH: Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. CB: Conceptualization, Writing – review & editing, Funding acquisition, Methodology. CC: Conceptualization, Writing – review & editing, Funding acquisition, Methodology. M-JD: Conceptualization, Writing – review & editing, Funding acquisition, Methodology. NG: Conceptualization, Writing – review & editing, Funding acquisition, Methodology. ÉM: Conceptualization, Writing – review & editing, Funding acquisition, Methodology. MM: Conceptualization, Writing – review & editing, Funding acquisition, Methodology. MT: Conceptualization, Writing – review & editing, Funding acquisition. H-MV: Conceptualization, Writing – review & editing, Funding acquisition, Methodology. BV: Conceptualization, Funding acquisition, Methodology, Supervision, Writing – original draft, Writing – review & editing.

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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.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

Publisher's note

Supplementary material

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Occupational therapy treatment of public safety personnel with work-related psychological injuries: analyzing Ontario worker's compensation data from 2017–2021

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This study explored the usage of occupational therapy treatment with psychologically injured public safety personnel (PSP) from Ontario, Canada. We used a descriptive quantitative approach with summary data provided by the Workplace Safety and Insurance Board (WSIB) of Ontario documenting occupation therapy (OT) treatment of psychologically injured PSP who had an approved WSIB Mental Stress Injury Program (MSIP) claim between 2017 and 2021. Variables examined included demographics, career type, injury type, and return to work (RTW) outcomes. Chi-square Tests of Independence were used to compare differences between PSP who received OT treatment and those who did not. Analysis revealed that in the total cohort of 6674 approved PSP MSIP claims, 15% (n = 991) of PSP received OT treatment. Communicators (21%) and correctional workers (17%) were most likely to receive OT treatment while paramedics (13%) were less likely. PSP claimants who received OT treatment were more likely to have a cumulative event injury (71%) compared to the rest of the cohort (55%) and were more likely to not have started a RTW process (62%) compared to the rest of the cohort (43%). PSP who received OT treatment had more days away from work on average than those who did not (913 days vs. 384 days). This data reveals that PSP with cumulative injuries and higher lengths of time away from work more frequently received OT treatment as part of their WSIB MSIP claim; it is possible that this higher degree of claim complexity influenced their RTW outcomes. Worker's compensation organizations should consider their health care decision-making processes to foster prompt access to treatment and proactive RTW pathways.

KEYWORDS

first responders, occupational health, occupational therapy (MeSH), posttraumatic stress disorder (PTSD), public safety personnel, return to work (RTW)

1 Introduction

Canadian "Public Safety Personnel" (PSP), including first responders, work to ensure public safety and include professionals such as communicators, correctional workers, firefighters, paramedics, and police officers (1). In their work, PSP are often exposed to potentially psychologically traumatic events (PPTE) known to contribute to the development of stress-related mental health conditions, including posttraumatic stress disorder (PTSD), depression, and anxiety disorders (2, 3). These conditions can impact mood, sleep, executive function, relationships, and the ability to work (4–7). A recent Canadian study assessed a large sample of PSP, with approximately two in five participants screening positive for one or more mental health disorders, primarily major depressive disorder (26.4%) and PTSD (23.2%) (2).

In Ontario, Canada, PSP with work-related psychological injuries may be eligible for support through the Workplace Safety and Insurance Board (WSIB) of Ontario – Mental Stress Injury Program (MSIP). This program offers a variety of benefits for injured workers including health care coverage, loss of earnings benefits, and return to work (RTW) support services. For many PSP organizations and affected communities, MSIP claims represent substantial costs, including wage replacement for employees on leave, backfilling positions, and healthcare related costs (8). The number of MSIP claims made by PSP workers has increased in Ontario in recent years; WSIB reported an increase in this type of claim from 0.3% in 2002 to 3% in 2020 (9), and a 2023 study documented an annual claim increase from 1,050 in 2017 to 1,420 in 2021 (10). Compounding these costs is the potentially lengthy nature of these claims (11), with half of the WSIB MSIP claims made between 2016 and 2020 lasting longer than 2 years (12).

A recent study of Ontario first responders showed that those with psychological injuries returned to work at a slower pace than those with musculoskeletal injuries and that claim and medical lag time delayed RTW (13). Further, a synthesis of systematic reviews has identified common factors that affect RTW outcomes after injury/illness; factors associated with positive RTW outcomes are lower injury/illness severity, RTW coordination, and multidisciplinary interventions that include the workplace and stakeholders (14). Common factors associated with negative RTW outcomes are older age, being female, and previous sick leave and unemployment (14).

Occupational therapists (OTs) are one of the health professions involved in delivering multidisciplinary interventions to support RTW after injury/illness (14, 15). In Ontario, OTs are increasingly involved in addressing the needs of PSP who have made a WSIB MSIP claim, and research in this area is limited but developing. A recent survey-based study revealed that Ontario PSP with MSIP claims were most frequently treated by general practitioners (44%), OTs (60%), and psychologists (61%) (15). This study also provided insight into the practices of OTs with this population, showing that PSP valued OT's community based and practical approaches to RTW (13). A subsequent survey-based study of the OTs providing these RTW services in Ontario showed that this is a growing practice area and that more evidence is needed to describe the current state of practice with PSP (16).

Given the current lack of data on the usage of OT treatment with psychologically injured PSP, and the reported growing use of OT treatment with this population in Ontario, the goal of the current study was to investigate the usage of OT treatment in approved WSIB MSIP claims for PSP in Ontario, using available data from between 2017 and 2021. Specifically, this study sought to answer the following questions: What are the characteristics of PSP who received OT treatment as part of their MSIP claim? How do they compare to those who did not receive OT treatment? How do the RTW outcomes for these two groups compare?

2 Methods

This descriptive quantitative study explored WSIB MSIP claimant data documenting OT involvement in the treatment of work-related psychological injuries among PSP between January 1, 2017, and December 31, 2021. The data was accessed through a data sharing agreement between WSIB and the first author and captured the first five years after a legislation change in Ontario in 2016 had expanded eligibility for PTSD claims for Ontario PSP (10). To protect the privacy of the study population, the terms of the data sharing agreement stipulated that summary data, and not individual claim level data, would be provided by the WSIB data analysis team. Continuous variables were provided as means and categorical variables were provided as counts. This study received ethical review and approval through the Queen's University Health Sciences Research Ethics Board (HS-REB).

The data consisted of 6674 claims, 991 of which included OT treatment arranged and funded by WSIB. The claims that received OT treatment were identified by existing WSIB billing codes for community-based OT treatment sessions. From 2017-2021, WSIB-funded OT treatment was typically provided through these community-based OT services. Thus, it is likely that most OT treatment for PSP with approved MSIP claims were captured by these billing codes. The data summary shared by WSIB did not specify how or why claimants were referred for treatment, nor how many specific OT treatment sessions they received.

The claim data included three categories of variables: (1) claimant specific variables (PSP career category, age, sex, years of job experience), (2) claim specific variables (nature of injury, mean number of days off work), (3) RTW variables (RTW successful, RTW unsuccessful, or no RTW participation). The RTW variables were defined by WSIB as "RTW successful" (an injured worker has resumed employment successfully); "RTW unsuccessful" (an injured worker was unable to return to employment); "no RTW participation" (an injured worker was never assigned to a RTW program). Data on the type of job that PSP returned to (e.g., own job, own employer; new job, own employer; new job, new employer) was not provided by WSIB. All MSIP categories were included: chronic mental stress, traumatic mental stress, and PTSD. To protect the privacy and confidentiality of claimants, WSIB did not share summary data that consisted of 5 or fewer claimants. As a result, a small percentage of the data was missing in some smaller career categories (see the Results tables for further detail). To facilitate statistical analysis, smaller career categories (by-law officers and commissioned police, fire chiefs and officers, managers in social, community, and correctional services and probation officers) were merged into one of five larger career categories: communicators, correctional workers, firefighters, paramedics, and police officers. See Data Variable Table for details (Appendix A, Supplementary Material).

Analyses focused primarily on exploring claims that included OT treatment and how these claims differed from those that did not include OT treatment. Continuous variables were provided by WSIB as means, and these are reported in the Results section and in the Tables. Categorical variables were provided by WSIB as counts, and it was possible to analyze these variables further to understand if there were any associations between those who received OT treatment and those who did not. Chi-Square Tests of Independence, which analyze the independence or association of categorical variables, were conducted to compare the observed and expected frequencies of the categorical variables. Data analysis was carried out using the Social Science Statistics Chi-Square Test Calculator, which is suitable for analyzing summary data.

3 Results

3.1 Overview of claimant data

Of the 6674 PSP claims, 14.8% of claims (n = 991) included occupational therapy treatment. Data on the average age and years of experience for claimants was provided by WSIB for each career category (Table 1). Claimants who received OT treatment were on average older (43.25 years) than those who did not (41.5 years). Information regarding the biological sex of claimants was available for 6655 claims. Females made up 33.3% (n = 2213) of the total sample but 40.8% (n = 399) of the claimants who received OT treatment. WSIB categorized MSIP claim injuries as either "single event" injuries or "cumulative event" injuries, with single event injuries resulting from a one-time traumatic event, while cumulative events resulted from multiple traumatic events or substantial work-related stressors. Of the 6674 PSP claims analyzed, nature of injury data was available for 6457 claims (Table 2). Overall, there were more cumulative event injury claims in the sample (57.6%, n = 3719) with 18.8% (n = 699) of those involving OT treatment, while only 9.3% (n = 254) of the single event claims (n = 2738) involved OT treatment.

Across all five PSP career categories, claims that received OT treatment also involved more mean days off work (mean = 913.2 days) than claims that did not include OT (mean = 384.4 days) (Table 2). WSIB reported 3 types of RTW outcomes: RTW successful, RTW unsuccessful, and no RTW participation, meaning that an injured worker was never assigned to a RTW program (see Appendix A). Over half the total claimants had been assigned to a RTW program (54.5%, n = 3636), while 45.5% (n = 3038) had yet to be assigned to a RTW program at the time of data collection (Table 3). Of the claims that involved OT treatment (n = 991), 38.3% (n = 380) had been assigned to a RTW program, while 61.7% (n = 611) had yet to be assigned to a RTW program. Overall, for those assigned to a RTW program (n = 3636), success rates were high with 96.7% (n = 3517) successful in RTW, while 3.3% (n = 119) did not RTW successfully.

3.1.1 Summary by career category

Of the 6674 claims analyzed, 475 were from communicators (7.1%), 1441 were from correctional workers (21.6%), 626 were from firefighters (9.4%), 1897 were from paramedics (28.4%), and 2235 were from police (33.4%). 991 claims (14.8%) included occupational therapy treatment, and career information was available for 982 of these claims.

21% of communicators (n = 100) were referred to OT. Those who were referred to OT were 44.4 years old with 18.3 years of experience on average, 77% were female and 73.7% had cumulative event claims. The OT group had a mean of 902.5 days off from work; 32% RTW successfully, 3% did not RTW and 65% were not assigned to a RTW program. The 375 communicators who were not referred to OT were younger at 42 years of age and 15.4 years of experience on average, 80.8% were female and 62.1% had cumulative event claims. They had fewer mean days off work at 408.1 days; 47.7% successfully RTW, 1.6% did not RTW and 50.7% were not assigned to a RTW program. See Tables 1–3 for further detail.

16.9% of correctional workers (n = 243) were referred to OT. Those who were referred to OT were 42.9 years old with 21.6 years of experience on average, 57.7% were male and 74.8% had cumulative event claims. The OT group had a mean of 936.7 days off from work; 28.4% RTW successfully, 2.8% did not RTW and 68.7% were not assigned to a RTW program. The 1198 correctional workers who were not referred to OT were younger at 40.5 years of age and 18.6 years of experience on average, 66.9% were male and 52.3% had cumulative event claims. They had fewer mean days off work at 384.4 days; 59.7% successfully RTW, 1.4% did not RTW and 38.9% were not assigned to a RTW program. See Tables 1–3 for further detail.

15.1% of firefighters (n = 94) were referred to OT. Those who were referred to OT were 46.8 years old with 28.8 years of experience on average, 91.5% were male and 83.7% had cumulative event claims. The OT group had a mean of 1180.3 days off from work; 38.8% RTW successfully, 2.0% did not RTW and 59.2% were not assigned to a RTW program. The 528 firefighters who were not referred to OT were younger at 46.5 years of age and 22.6 years of experience on average, 92.2% were male and 76.3% had cumulative event claims. They had fewer mean days off work at 403.6 days; 35.2% successfully RTW, 1.9% did not RTW and 62.8% were not assigned to a RTW program. See Tables 1–3 for further detail.

12.7% of paramedics (n = 241) were referred to OT. Those who were referred to OT were 40.4 years old with 17.7 years of experience on average, 52.3% were male and 60.2% had cumulative event claims. The OT group had a mean of 778.6 days off from work; 46.9% RTW successfully, 2.5% did not RTW and 50.6% were not assigned to a RTW program. The 1656 paramedics who were not referred to OT were younger at 37.5 years of age and 13.7 years of experience on average, 61.7% were male and 37% had cumulative event claims. They had fewer mean days off work at 195.6 days; 71.2% successfully RTW, 1.2% did not RTW and 27%

TABLE 1 Demographics.

Total (n = 6665)	Communicators (n = 475, 7.1%)	Corrections (n = 1441, 21.6%)	Firefighters (n = 622, 9.3%)	Paramedics (n = 1897, 28.5%)	Police (n = 2230, 33.5%)
OT (n = 982)*	21.0% (100)	16.9% (243)	15.1% (94)	12.7% (241)	13.6% (304)
No OT (n = 5683)	79.0% (375)	83.1% (1198)	84.9% (528)	87.3% (1656)	86.4% (1926)
Mean Age (years)					
Total	42.5	41.1	46.5	37.8	43.1
OT	44.4	42.9	46.8	40.4	44.3
No OT	42.0	40.5	46.5	37.5	42.9
Job Experience (years)					
Total	16.1	19.1	23.5	14.2	18.8
OT	18.3	21.6	28.8	17.7	20.3
No OT	15.4	18.6	22.6	13.7	18.6
Female**					
Total (n =2213, 33.3%)	80% (380)	34.6% (496)	7.9% (49)	39.5% (749)	24.2% (539)
OT	77% (77)	42.3% (101)	8.5% (8)	47.7% (115)	32.2% (98)
No OT	80.8% (303)	33.1% (395)	7.8% (41)	38.3% (634)	22.9% (441)
Male**					
Total (n= 4442, 66.7%)	20% (95)	65.4% (936)	92.1% (573)	60.5% (1148)	75.8% (1690)
OT	23.0% (23)	57.7% (138)	91.5% (86)	52.3% (126)	67.8% (206)
No OT	19.2% (72)	66.9% (798)	92.2% (487)	61.7% (1,022)	77.1% (1,484)

No OT, Not Referred to Occupational Therapy; OT, Referred to Occupational Therapy.
Percentages in rows total vertically.
*0.13 % (n = 9) of claims were missing data on OT treatment status.
**0.28% (n= 19) of claims were missing data on sex.

were not assigned to a RTW program. See Tables 1–3 for further detail.

13.8% of police (n = 309) were referred to OT. Those who were referred to OT were 44.3 years old with 20.3 years of experience on average, 67.8% were male and 79.4% had cumulative event claims. The OT group had a mean of 922.6 days off from work; 33.3% RTW successfully, 2.3% did not RTW and 53.3% were not assigned to a RTW program. The 1926 police who were not referred to OT were younger at 42.9 years of age and 18.6 years of experience on average, 77.1% were male and 64.6% had cumulative event claims. They had fewer mean days off work at 395.4 days; 46.4% successfully RTW, 2.1% did not RTW and 51.5% were not assigned to a RTW program. See Tables 1–3 for further detail.

3.2 Chi square analysis of claimant data by treatment status

Chi-Square Tests of Independence were performed for all available categorical variables (career category, sex, injury type, RTW status) to understand if there were any associations in the sample between those who received OT treatment and those who did not.

A significant relationship was found between OT treatment status and PSP career category, $X^2(4, N = 6665) = 28.74$, p <.001. Follow-up comparison tests revealed that there were proportionally more communicators whose claims included OT treatment (OT, 10.2% vs. No OT, 6.6%), $X^2(1, N = 6665) = 16.26$, p <.001. There were also proportionally more correctional workers whose claims included OT treatment (OT, 24.7% vs. No OT, 21.7%), $X^2(1, N = 6665) = 6.64$, p = .01. Conversely, there were proportionally fewer paramedics whose claims included OT treatment (OT, 24.5% vs. No OT, 29.1%), $X^2(1, N = 6665) = 8.7$, p = .003. Further tests revealed that the proportion of claims made by police and firefighters did not differ significantly as a function of OT treatment status (all p >.05). A significant relationship was found between OT treatment status and sex, revealing that proportionally more females had claims that included OT treatment (OT, 40.8% vs. No OT, 32%) and conversely, proportionally fewer males received OT treatment (OT, 59.2% vs. No OT, 68%), $X^2(1, N = 6655) = 29.4$ p <.001. See Table 1 for claimant demographics.

Proportionally more cumulative claims included OT treatment (OT, 73.7% vs. No OT, 62.1%) compared to single events claims

TABLE 2 Claims data.

Total (n = 6457)*	Communicators (n = 468, 7.2%)	Corrections (n = 1361, 21.1%)	Firefighters (n = 603, 9.3%)	Paramedics (n = 1858, 28.8%)	Police (n =2167, 33.6%)
Treatment Status					
OT (n = 953)	21.2% (99)	16.9% (230)	15.3% (92)	12.7% (236)	13.7% (296)
No OT (n = 5504)	78.8% (369)	83.1% (1131)	84.7% (511)	87.3% (1622)	86.3% (1871)
Nature of Claim					
Single Event Claims					
Total (n = 2738, 42.4%)	35.5% (166)	43.9% (597)	22.6% (136)	60.1% (1116)	33.3% (723)
OT (n = 254)	26.3% (26)	25.2% (58)	16.3% (15)	39.8% (94)	20.6% (61)
No OT (n = 2484)	37.9% (140)	47.7% (539)	23.7% (121)	63.0% (1022)	35.4% (662)
Cumulative Event Claims					
Total (n = 3719, 57.6%)	64.5% (302)	56.1% (764)	77.4% (467)	39.9% (742)	66.6% (1444)
OT (n = 699)	73.7% (73)	74.8% (172)	83.7% (77)	60.2% (142)	79.4% (235)
No OT (n = 3020)	62.1% (229)	52.3% (592)	76.3% (390)	37.0% (600)	64.6% (1209)
Mean Days Off Work					
Total	512.1	477.7	522.1	269.7	467.4
OT (n = 991)	902.5	936.7	1,180.3	778.6	922.6
No OT (n = 5686)	408.1	384.4	403.6	195.6	395.4

No OT, Not Referred to Occupational Therapy; OT, Referred to Occupational Therapy.
Percentages in rows total vertically.
* 3.25% (n =217) of claims were missing data regarding the nature of the claim.

(OT, 26.3% vs. No OT, 37.9%), $X^2(1, N = 6457) = 113.57$, $p < .001$. Additionally, cumulatively injured workers from all PSP career categories, except for firefighters, were proportionally more likely to receive OT treatment than those with single event injuries: communicators, $X^2(1, N = 468) = 4.65$, $p = .03$ (cumulative, 15.6% vs. single, 5.5%); corrections, $X^2(1, N = 1361) = 39.1$, $p < .001$ (cumulative, 12.6% vs. single, 4.3%); paramedics, $X^2(1, N = 1858) = 46.14$, $p < .001$ (cumulative, 7.6% vs. single, 5.1%), and police, $X^2(1, N = 2167) = 25.01$, $p < .001$ (cumulative, 10.8% vs. single, 2.8%). See Table 2 for further detail. Proportionally fewer claimants whose claims included OT treatment had been assigned to a RTW program (OT, 38.3% vs. No OT, 57.3%) and conversely more claimants whose claims included OT treatment had not yet been assigned to a RTW program (OT, 61.7% vs. No OT, 42.7%), $X^2 (1, N = 6674) = 122.17$, $p < .001$. Further, fewer PSP whose claim included OT treatment successfully RTW (OT, 35.8% vs. No OT, 55.6%), $X^2(1, N = 3636) = 14.7$, $p < .001$. See Table 3 for RTW outcomes.

4 Discussion

This descriptive quantitative study explored WSIB Ontario claims data documenting OT treatment for psychologically injured PSP who had an approved MSIP claim between 2017 and 2021. This study sought to compare the MSIP claims of PSP who received OT treatment to those who did not, focusing on the demographic characteristics of claimants, claim complexity, and RTW outcomes. This study, centered on the worker's compensation usage of occupational therapy treatment with psychologically injured PSP, is the first of its kind in Ontario, Canada, and beyond. Existing literature relevant to worker's compensation, PSP, occupational therapy, and return to work is discussed in the following sections.

4.1 Claim characteristics and complexity

Of the 6674 PSP claims analyzed, 15% included occupational therapy treatment, and communicators had the highest proportion of claims involving OT treatment, followed by corrections, firefighters, police, and paramedics. A previous study of these WSIB MSIP claims found that when compared to their peers, paramedics had fewer cumulative injuries and were more likely to return to work than other PSP career groups (10). Since this study suggests that claims with higher complexity (as indicated by cumulative injuries and higher days off work) were sent to OT at proportionally higher rate, it is perhaps unsurprising that paramedics, the one PSP career group with more single event injury claims, received OT treatment less frequently. Paramedics were also the youngest group in the sample with the fewest years of experience on the job. Given that those who received OT treatment

TABLE 3 RTW outcomes.

(n = 6674)	Totals	Communicators (n=475, 7.1 %)	Corrections (n=1441, 21.6%)	Firefighters (n=626, 9.4%)	Paramedics (n=1897, 28.4%)	Police (n=2235, 33.4%)
Treatment Status	OT (n = 991)	21.0% (100)	16.9% (243)	15.7% (98)	12.7% (241)	13.8% (309)
	No OT (n = 5683)	79.0% (375)	83.1% (1198)	84.3% (528)	87.3% (1656)	86.2% (1926)
RTW Successful						
Total	52.7% (3517)	44.4% (211)	54.4% (784)	35.8% (224)	68.6% (1302)	44.6% (996)
OT	355	32.0% (32)	28.4% (69)	38.8% (38)	46.9% (113)	33.3% (103)
No OT	3162	47.7% (179)	59.7% (715)	35.2% (186)	71.2% (1189)	46.4% (893)
RTW Unsuccessful						
Total	1.8% (119)	1.9% (9)	1.7% (24)	1.9% (12)	1.4% (26)	2.1% (48)
OT	25	3.0% (3)	2.8% (7)	2.0% (2)	2.5% (6)	2.3% (7)
No OT	94	1.6% (6)	1.4% (17)	1.9% (10)	1.2% (20)	2.1% (41)
No RTW Participation						
Total	45.5% (3038)	53.7% (255)	43.9% (633)	62.3% (390)	30.0% (569)	53.3% (1191)
OT	611	65.0% (65)	68.7% (167)	59.2% (58)	50.6% (122)	64.4% (199)
No OT	2427	50.7% (190)	38.9% (466)	62.8% (332)	27.0% (447)	51.5% (992)

No OT, Not Referred to Occupational Therapy; OT, Referred to Occupational Therapy; RTW, Return to Work.
Percentages in rows total vertically.

were on average older than the PSP who did not receive OT treatment, the lower rates of OT treatment observed among paramedics is in keeping with this finding.

This study also revealed that proportionally more female PSP than male received OT treatment. Given that communicators were the one PSP category where females outnumbered males, it is logical that more communicators received OT treatment. Previous studies found that women and female identifying PSP are more likely to be diagnosed with mental health conditions and to seek help; the higher rates of OT treatment observed among communicators in this sample may be reflective of these findings (17).

The study results suggest that claims that included OT treatment were more complex for a variety reasons. They were made by older PSP with more years of experience on the job, and proportionally more of these claimants were female. Additionally, claims that included OT treatment were more likely to be cumulative in nature. Claims that included OT treatment also involved on average more days off work than claims that did not include OT. These findings echo previous studies that found that exposure to PPTE increases with years of experience (17) and support the idea that more complex cases received OT treatment.

4.2 Return to work outcomes

PSP who received OT treatment as part of their WSIB MSIP claim had slightly lower rates of successful RTW and a higher likelihood of not having started a RTW process compared to those who did not receive OT treatment. The claim duration was also much longer for those who received OT treatment (approximately 2.5 years) compared to those who did not (approximately 1 year). A previous study of this cohort also found that PSP waited on average 1.5 years to be referred to OT after their WSIB MSIP claim was approved (18). In addition, those who received OT treatment had indicators of higher claim complexity, including being older on average, having a higher proportion of cumulative injuries, and having longer claim durations. Previous research on RTW factors for a variety of populations, including those with mental health conditions, indicates that key risk factors to unsuccessful RTW include age, female sex, comorbidities, and severity of injury (14, 19). Additionally, a previous study of Ontario PSP showed that most PSP did not RTW after posttraumatic stress injury rehabilitation, although there were improved outcomes with earlier intervention (13).

There is no publicly available information that explains decision-making processes within WSIB related to referrals to healthcare professionals for claimants. Considering the outcomes observed in this study, and the broader literature on RTW factors, it appears that since WSIB is referring older PSP with higher levels of injury severity to OT, and that these referrals often come late in the claim duration, these PSP would naturally be less likely to RTW. Additionally, there may be contextual factors for different PSP career groups that influence the RTW outcomes; for example, firefighters were the oldest group at 47 years of age on average, and those closer to retirement age may have had less reason to attempt a RTW process.

4.3 Key takeaways from this study

Occupational therapy is often used with populations who have complex health conditions, including both physical and mental health injuries, illnesses, and related disabilities; in this study it is not surprising that the cohort who received OT treatment had indicators of higher injury severity and lower RTW rates. However, in this cohort, delays in access to OT, which were 1.5 years on average (18), may have had an outsize impact on the outcomes for this group. Gross et al. (20) found that Ontario PSP who received earlier rehabilitation for their posttraumatic stress injuries had improved RTW outcomes, and a recent study from WSIB showed that earlier access to mental health interventions for traumatic brain injury (TBI) claimants predicted earlier RTW outcomes (21). A Canadian study of first responders receiving disability management for workplace injuries found that predictors of RTW included injury type, with mental health claims having longer duration, and claim and medical time lag delaying RTW (13). Additionally, another recent study of Ontario police officers revealed that timeliness was an important factor in the RTW journeys of these PSP (22).

With lengthy worker's compensation claim durations comes rising economic costs, further making the case for earlier access to rehabilitation services like OT. A recent economic analysis of the impact of OT on RTW for people with mental health conditions demonstrated positive RTW outcomes along with cost savings for several RTW models (23). Additionally, this analysis showed that adding OT to a program for depression improved outcomes and had an economic benefit.

This study's findings are a first step in understanding how OT treatment is used by WSIB Ontario with PSP MSIP claims. As PSP are a group with lower RTW rates compared to other WSIB claim types (10), regardless of OT treatment status, representing significant human and financial costs, this issue needs further study. Future research should investigate claim level data to understand the risk factors that are driving claim length and lack of RTW readiness. Additionally, data that expand on how WSIB is using community OT treatment and other factors that may influence RTW outcomes (e.g. specific injury, number of OT treatment sessions, other healthcare professionals and their treatment counts, medications, career stage) should be explored. This future research can help workers compensation organizations update their return to work processes and utilize occupational therapy, and other health care professionals, optimally.

4.4 Study limitations

In this study, the data provided by WSIB was in summary format, limiting potential statistical tests and the research team's ability to explore claim-level variables. Additional demographic variables like socioeconomic status, race, and marital status were not available and their impact on outcomes could not be analyzed. Additionally, standard deviations and ranges were not provided by WSIB for continuous variables and statistical analyses on means could not be conducted. Since the data set was from 2017-2021, recent changes to this data are unknown. It is possible that changes in RTW status or OT referral status occurred for some PSP after 2021, particularly for those with claims that were made later in the five-year period. The results draw on data from Ontario, Canada, which may limit generalizability to other contexts and worker's compensation systems.

5 Conclusion

This study is the first to describe the usage of occupational therapy treatment for psychologically injured PSP in Ontario. Using summary data, it compared WSIB MSIP claims for Ontario PSP who received OT treatment to those who did not for the years 2017 to 2021. PSP who received OT treatment were more likely to be female, to be older and have more years of experience, and to have cumulative injuries. The cohort who received OT treatment were more likely to not have started a RTW process and had longer overall claim durations. Past research on this cohort also shows that this group waited on average 1.5 years into their claim duration to begin OT treatment. RTW research shows that earlier access to rehabilitation for PSP and other populations is associated with better RTW outcomes. Since the OT treatment referral decision-making processes and pathways within WSIB are not publicly known, it would be beneficial for WSIB to review its processes and consider streamlining access to OT, particularly considering its demonstrated economic benefits with clients with mental health conditions. Researchers could seek a more detailed data set in order to consider long term return to work trajectories, as well as modelling the impact of variables on return to work status and OT referral status. Further research is needed to understand the reasons for the current usage of OT treatment within WSIB, and other claim-level factors that may be influencing RTW outcomes for those referred for OT treatment, to make more comprehensive recommendations for the usage of OT treatment with psychologically injured PSP.

Data availability statement

The original data set used in this study is owned by the Workplace Safety Insurance Board of Ontario and is not publicly available due to privacy guidelines. Requests to access the datasets should be directed to edgelowm@queensu.ca.

Ethics statement

The studies involving humans were approved by Queen's Health Sciences Research Ethics Board (HS-REB). The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and institutional requirements.

Author contributions

ME: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. AF: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Validation, Visualization, Writing – original draft.

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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.2024.1377157/full#supplementary-material

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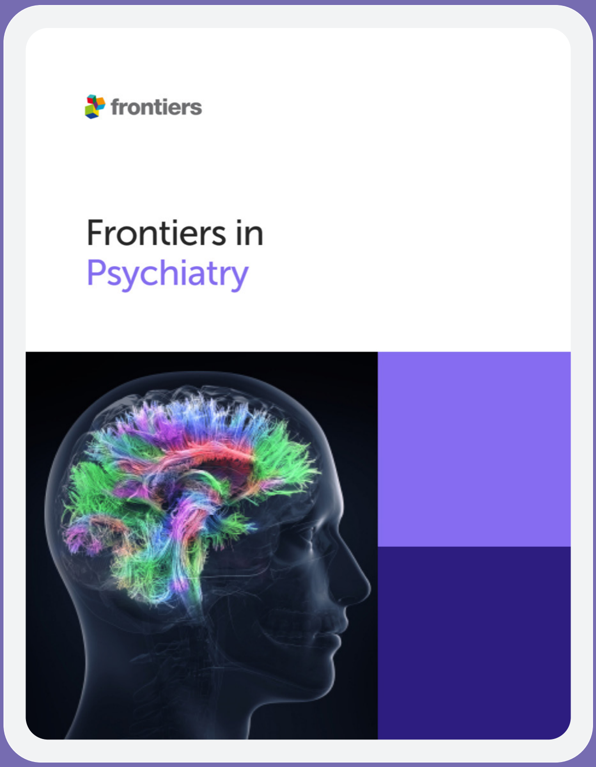

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