MEDICAL EDUCATION IN PSYCHIATRY

EDITED BY: Doron Amsalem, Andres Martin and Robbert Duvivier
PUBLISHED IN: Frontiers in Psychiatry and Frontiers in Psychology

frontiers Research Topics

ISSN 1664-8714
ISBN 978-2-88971-770-5
DOI 10.3389/978-2-88971-770-5

About Frontiers

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

Frontiers Journal Series

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

Dedication to Quality

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

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the Frontiers Journals Series: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area! Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers Editorial Office: frontiersin.org/about/contact

MEDICAL EDUCATION IN PSYCHIATRY

Topic Editors:
Doron Amsalem, Columbia University, United States
Andres Martin, Yale University, United States
Robbert Duvivier, Parnassia Psychiatric Institute, Netherlands

Citation: Amsalem, D., Martin, A., Duvivier, R., eds. (2021). Medical Education in Psychiatry. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88971-770-5

Table of Contents

frontiers in Psychiatry

EDITORIAL
published: 04 October 2021
doi: 10.3389/fpsyt.2021.764567

Editorial: Medical Education in Psychiatry

Doron Amsalem[1]*, *Robbert Duvivier*[2,3] *and Andrés Martin*[4]

[1] New York State Psychiatric Institute and Department of Psychiatry, Columbia University Vagelos College of Physicians & Surgeons, New York, NY, United States, [2] Center for Educational Development and Research in Health Sciences (CEDAR), LEARN, University Medical Center Groningen, Groningen, Netherlands, [3] Parnassia Psychiatric Institute, The Hague, Netherlands, [4] Child Study Center, School of Medicine, Yale University, New Haven, CT, United States

Keywords: medical education, online platform, psychiatry, stigma, simulation, simulated patients, training

Editorial on the Research Topic

Medical Education in Psychiatry

Medical education in psychiatry stands to gain from educational innovations but has been slow on the uptake. For example, although simulated-patient (SPs)-based methodology has a rich history in medical education, its use in psychiatry has only emerged more recently. Simulation is particularly effective in bridging the gap between clinical practice and education. The use of professional actors as SPs offers advantages that have been well-reviewed in the literature (1). Practicing pre-specified clinical scenarios in a safe environment carries no risk of harm by inexperienced students or residents. It provides the trainer and trainee the opportunity to focus their attention on relevant objectives for specific training needs (2). In addition, the unprecedented nature and scale of the COVID-19 outbreak created a rare opportunity to shift traditional in-person SP training to online platforms. This approach provides several important advantages: greater ease of dissemination to large audiences, training consistency across different geographic locations; interaction in real time with content experts and fellow learners; and logistic ease in securing curricular content and experienced faculty (3).

Stigma toward psychiatry and people with mental illness is prevalent. Stigma among physicians contributes to poor medical treatment and outcomes, including earlier death in patients with psychiatric disorders like schizophrenia (4, 5). Starting in medical school, and despite overwhelming evidence to the contrary, students commonly report that psychiatric treatments have little effect or utility and view the specialty as a non-evidence-based, unscientific, barely medical discipline (6). Interventions to reduce stigma, including online programs that embed SPs and principles of direct social contact (7), have the potential to change this biased outlook early in medical education.

There is an urgent need to bring state-of-the-art teaching and educational approaches into all domains of psychiatric education: from the undergraduate level in medical school, through graduate training in residency and fellowships, and into the lifelong learning of community and academic practice. The number of peer-reviewed scholarly publications dedicated to medical education in psychiatry is relatively limited, particularly compared to disciplines such as internal medicine and surgery. Thus, rigorous publications in peer-reviewed outlets are a modifiable factor that could enhance interest in, and foster the development of this scholarly domain. To that end, we invited contributions of work at the interface of medical education and psychiatry for a special issue of *Frontiers in Psychiatry*.

Several studies in this issue investigate the intersection between the use of SPs and delivery via synchronized videoconferencing. In an example of innovative use of SPs, Martin et al. describe the first implementation, in child psychiatry, of Co-Constructive Patient Simulation (CCPS), an experiential approach that fosters autonomous, meaningful, and individually tailored learning opportunities generalizable to any medical specialty. Drozdowicz et al. developed a didactic using

OPEN ACCESS

Edited and reviewed by:
Thomas Jamieson Craig, King's College London, United Kingdom

***Correspondence:**
Doron Amsalem
doron.amsalem@gmail.com

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *25 August 2021*
Accepted: *06 September 2021*
Published: *04 October 2021*

Citation:
Amsalem D, Duvivier R and Martin A (2021) Editorial: Medical Education in Psychiatry. Front. Psychiatry 12:764567. doi: 10.3389/fpsyt.2021.764567

SPs that addresses sexual health specifically pertinent to psychiatrists working with adolescents and their families. They found that video-based examples using SPs measurably improved factual knowledge—and decreased discomfort in addressing the topic in routine clinical practice.

Three studies in the collection use multi-component approaches, each involving SPs, to address very different learning objectives. In another example in child psychiatry education, Curtin et al. demonstrated the efficacy of an interactive online curriculum designed to equip learners with practical tools to care for patients with pediatric depression and suicidality. In turn, Rodríguez-Rivas et al. found a positive impact in reducing mental health stigma after participation in an online, multi-pronged program that incorporates project-based learning, clinical simulations with SPs, and e-contact with individuals with schizophrenia. In the third of these studies, a non-inferiority trial incorporating interviews with SPs, Rauch et al. found no difference in grades in an objective structured clinical examination (OSCE) between students learning on-site vs. online.

Altough there is a rich scholarship on best practices to deliever challenging news, there are very few applications specific to psychiatry. Two of the articles in this series contribute to this gap in the literature. In a mixed methods study, Brand-Gothelf et al. describe stressful factors associated with sharing a diagnosis of schizophrenia (vs. ADHD) in the practice of child and adolescent psychiatry. Their findings contribute to a better understanding of the critically important yet inadequately addressed topic of effective and compassionate diagnosis delivery in psychiatry. To help address that training gap, Amsalem et al. developed, implemented, and evaluated the effectiveness of an SP-based training module to improve psychiatric residents' clinical communication skills in delivering difficult news. The training module proved helpful in improving objectively measured communication skills and enhanced participants' subjective sense of confidence in their clinical skills.

Attesting to the growth, broad dissemination, and creative applications of simulation-based training in psychiatric education, Piot et al. present the most comprehensive review on the topic to date. The holistic and reflective nature of simulation aligns with the rich humanistic tradition of psychiatry and offers unique opportunities to support learners' clinical skills and develop and refine workforce competencies.

Three articles in the series focus on program developmend in psychiatric education. First, Calhoun et al. conducted a qualitative study to explore the impact and active components of a novel educational initiative designed to prepare physician-scientists for independent careers in investigating and treating childhood psychiatric disorders. They developed a heuristic model of practical relevance to other training initiatives within psychiatry—and beyond. Second, Kulkarni et al. developed a process to identify and prioritize key attributes to inform trainee selection into a psychiatry residency program. Their approach has additional programmatic implications, including curriculum, faculty, and mission and vision development. Finally, Wang et al. examined the role of perceived stress on depressive symptoms among medical students. Their findings emphasize the need to identify students with high achievement goal-orientation in learning environments that explicitly or unwittinlgy foster fierce competion. Providing such learners with the appropriate supportive services can help them manage stress and mitigate or prevent clinical depression or dropping out of medical school.

The 11 articles in this special collection encompasss contributions from over a dozen countries spread acrosss four continents. Their topic spectrum is broad and has practical applicability for educators in mental health working at undergraduate, graduate, or lifelong/continuous medical education levels. We hope that this thematic series will contribute to necessary and welcome exchanges between psychiatric training and best practices in medical education. Progress at this exciting interface could accelerate the growth of visibile and impactful publications dedicated to advancing medical education in psychiatry. The ultimate goal of these synergistic efforts is to improve the lives of so many who are impacted by mental illnesses.

AUTHOR CONTRIBUTIONS

DA, RD, and AM contributed to the final version of the manuscript. All authors contributed to the article and approved the submitted version.

REFERENCES

1. Schlegel C, Woermann U, Rethans JJ, Van Der Vleuten C. Validity evidence and reliability of a simulated patient feedback instrument. *BMC Med Educ*. (2012) 12:6. doi: 10.1186/1472-692 0-12-6
2. Gómez JM, Prieto L, Pujol R, Arbizu T, Vilar L, Pi F, et al. Clinical skills assessment with standardized patients. *Med Educ*. (1997) 31:94–8. doi: 10.1111/j.1365-2923.1997.tb02465.x
3. Hilburg R, Patel N, Ambruso S, Biewald MA, Farouk SS. Medical education during the Coronavirus disease-2019 pandemic: learning from a distance. *Adv Chronic Kidney Dis*. (2020) 27:412–7. doi: 10.1053/j.ackd.2020.05.017
4. Thornicroft G, Rose D, Mehta N. Discrimination against people with mental illness: what can psychiatrists do? *Adv Psychiatr Treat*. (2010) 16:53–9. doi: 10.1192/apt.bp.107.004481
5. Rüsch N, Angermeyer MC, Corrigan PW. Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. *Eur Psychiatry*. (2005) 20:529–39. doi: 10.1016/j.eurpsy.2005.04.004
6. Amsalem D, Gothelf D, Dorman A, Goren Y, Tene O, Martin A, et al. Reducing stigma toward psychiatry among medical students: a multicenter controlled trial. *Prim Care Companion CNS Disord*. (2020) 22:19m02527. doi: 10.4088/PCC.19m02527
7. Thornicroft G, Mehta N, Clement S, Evans-Lacko S, Doherty M, Rose D, et al. Evidence for effective interventions to reduce mental-health-related stigma and dis- crimination. *Lancet*. (2016) 387:1123–32. doi: 10.1016/S0140-6736(15)00298-6

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

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 17 November 2020
doi: 10.3389/fpsyt.2020.593101

Sexual Health in Child and Adolescent Psychiatry: Multi-Site Implementation Through Synchronized Videoconferencing of an Educational Resource Using Standardized Patients

*Linda Drozdowicz[1], Elisabeth Gordon[2], Desiree Shapiro[3], Sansea Jacobson[4], Isheeta Zalpuri[5], Colin Stewart[6], A. Lee Lewis[7], Lee Robinson[8], Myo Thwin Myint[9], Peter Daniolos[10], Edwin D. Williamson[11], Richard Pleak[12], Ana Soledade Graeff Martins[13], Mary Margaret Gleason[14], Cathryn A. Galanter[15,16], Sarah Miller[17], Dorothy Stubbe[1] and Andrés Martin[1,2,18]**

[1] Child Study Center, Yale School of Medicine, New Haven, CT, United States, [2] Private Practice, New York, NY, United States, [3] University of California, San Diego, San Diego, CA, United States, [4] Western Psychiatric Hospital, Pittsburgh, PA, United States, [5] Stanford University, Palo Alto, CA, United States, [6] Georgetown University, Washington, DC, United States, [7] Medical University of South Carolina, Charleston, SC, United States, [8] Cambridge Health Alliance, Cambridge, MA, United States, [9] Tulane University, New Orleans, LA, United States, [10] University of Iowa, Iowa City, IA, United States, [11] Vanderbilt University Medical Center, Nashville, TN, United States, [12] Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY, United States, [13] Federal University of Rio Grande do Sul, Porto Alegre, Brazil, [14] Children's Hospital of the King's Daughters in Virginia, Norfolk, VA, United States, [15] SUNY Downstate Medical Center, Brooklyn, NY, United States, [16] Kings County Hospital Center, Brooklyn, NY, United States, [17] Temple University, Philadelphia, PA, United States, [18] Standardized Patient Program, Teaching and Learning Center, Yale School of Medicine, New Haven, CT, United States

OPEN ACCESS

Edited by:
Hector Wing Hong Tsang, Hong Kong Polytechnic University, Hong Kong

Reviewed by:
Devashish Konar, Mental Health Care Centre, India
Bhing-Leet Tan, Singapore Institute of Technology, Singapore

***Correspondence:**
Andrés Martin
andres.martin@yale.edu

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *10 August 2020*
Accepted: *05 October 2020*
Published: *17 November 2020*

Citation:
Drozdowicz L, Gordon E, Shapiro D, Jacobson S, Zalpuri I, Stewart C, Lewis AL, Robinson L, Myint MT, Daniolos P, Williamson ED, Pleak R, Graeff Martins AS, Gleason MM, Galanter CA, Miller S, Stubbe D and Martin A (2020) Sexual Health in Child and Adolescent Psychiatry: Multi-Site Implementation Through Synchronized Videoconferencing of an Educational Resource Using Standardized Patients. Front. Psychiatry 11:593101. doi: 10.3389/fpsyt.2020.593101

Objective: Matters of sexuality and sexual health are common in the practice of child and adolescent psychiatry (CAP), yet clinicians can feel ill-equipped to address them with confidence. To address this gap in training and practice, we developed, implemented, and evaluated an educational module enhanced by videotaped depictions of expert clinicians interacting with professional actors performing as standardized patients (SPs).

Methods: We developed an educational resource highlighting common issues of sexual health relevant to CAP practice, including sexual development, psychotropic-related side effects, and sexuality in children with autism. We wrote original scripts, based on which two clinicians interacted with three SPs. Digital recordings were edited to yield 5 clips with a cumulative running time of 20 min. The clips were interspersed during a 90-min session comprising didactic and interactive components. Due to the COVID-19 pandemic, we used synchronous videoconferencing, which allowed content dissemination to several training programs across the country.

Results: We recruited 125 learners from 16 CAP training programs through the American Academy of CAP's Alliance for Learning and Innovation (AALI). Routine inquiry into adolescent patients' sexual function was uncommon, reported by only 28% of participants, with "awkward" and "uncomfortable" the most common terms mentioned in

reference to the clinical task. The didactic intervention led to measurable improvements after 2 weeks in skills and knowledge ($p = 0.004$) and in attitudes ($p < 0.001$). The three items with the greatest improvement were: (a) availability of developmentally tailored resources; (b) comfort in addressing sexual development with underage patients; and (c) with parents or guardians of neuroatypical or developmentally disabled patients ($p < 0.001$ for each).

Conclusions: A sexual health curriculum enriched by video-based examples can lead to measurable improvement in outcomes pertinent to the clinical practice of CAP. These educational materials are available for distribution, use and adaptation by local instructors. Our study also provides proof-of-principle for the use of multisite educational initiatives in CAP through synchronized videoconferencing.

Keywords: child and adolescence psychiatry, sexual education, standardized patient, simulation, training and education

INTRODUCTION

Sexuality is elemental to the human experience and is engaged in throughout life. Sexual health is a critical element of general health. Defined as a state of physical, emotional, mental, and social wellbeing in relation to sexuality, it is not merely the absence of disease, dysfunction, or infirmity. It requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination, or violence (1).

The relationship between sexual health and general health is extensive. At the individual level, sexual well-being is positively correlated to physical and mental health, while at the community level, sexual health is associated with improved relationships, economic stability, and increased education and employment (2–6). In particular, sexual health and mental health are bidirectionally influential: Depression is the largest single comorbidity for sexual dysfunction, and sexual dysfunction is associated with a 2.3- to 3.1-fold increased risk for developing a major depressive disorder (7). In the context of the practice of medicine, the relationship between sexual and general health is further complicated by the potential for many medications, including psychotropics, to induce sexual dysfunction (8).

Since sexual health has great potential to impact and be impacted by other aspects of health, physicians should address and support the sexual health of their patients, even as the majority do not (9–11). One of the most significant reason physicians fail at this task is the lack of sexual health education in medical education (9–13), which trainees and physicians are overtly aware of.

Medical sexual health education is an ethical imperative. This education teaches physicians to address sexual health and therefore not cause harm by passively perpetuating the stigma surrounding sexuality (10); to initiate the discussion instead of placing the burden on the patient to do so, which can unintentionally limit access to care around a stigmatized topic (11); and to be aware of and minimize or mitigate iatrogenic sexual dysfunction (12). It also allows physicians to support larger public health efforts by destigmatizing sexuality and addressing it as an important component of health. Without this education, many physicians experience considerable levels of discomfort in addressing sexual health and sexuality with their patients (13–15).

High quality, medically accurate sex education, particularly when started early and provided additively, supports sexual health as children and adolescents develop. It increases empowerment and confidence during a critical period of physical and emotional growth (16) and reduces unprotected sex, pregnancy, and sexually transmitted infections (17). It also improves rates of sexual satisfaction, a key element of sexual health. Yet, many barriers to comprehensive, medically accurate, evidence-based sex education still persist in the US (18). In this context, child and adolescent psychiatrists (CAPs) have an opportunity and duty to intervene and provide relevant sexual health information to patients and families in order to improve their patients' health.

Sex education is often even less accessible to children and adolescents with special needs (19). Reasons range from simply not being provided, to being offered in a way that is inadequate for the individual's learning style or ability (19). This deficiency can have far-reaching effects. In children with autism spectrum disorder (ASD)—a common population in routine CAP practice—good sex education offers benefits beyond those normally expected in the neurotypical population. It provides sexual information directly relevant to physical health, such as how and when to clean one's genitals, menstrual hygiene, and when to seek medical attention—including for sexual symptoms such as loss of libido/desire, erectile dysfunction, or anorgasmia, among others (20). It can help curb the increased risk of sexual victimization for people with ASD (21), and it can also help prevent problematic sexual behaviors, such as public masturbation and unwanted touching, which can have major legal and social ramifications (22).

Moreover, sex education for children and adolescents with ASD or any disability should not be limited to physical health and safety information. Contrary to common assumptions, many people with ASD desire romantic and sexual relationships (23). All children and adolescents deserve and are entitled to the

same sexual health education, with the content curated for and presented in a way that is understandable to each individual (23). For those with ASD, this includes concrete teaching about relationships, courtship, and other social skills needed for success—topics that might be picked up from peers in children without ASD, but that may be missed in this population (20).

With this background in mind, we developed, deployed, and evaluated a sexual health educational module specific to the training needs of CAPs. We enhanced our didactic materials with video-based depictions of expert clinicians interacting with professional actors. Due to the COVID-19 pandemic, we provided the training via synchronous videoconferencing, an approach that permitted simultaneous sharing of educational content with several training programs across the country.

METHODS

Participants and Synchronized Videoconferencing Delivery

Participants comprised CAP faculty, fellows, and residents at Yale and those recruited through the American Academy of Child and Adolescent Psychiatry's Alliance for Learning and Innovation (AALI). Against the backdrop of the COVID-19 pandemic, the didactic was offered exclusively online, using the videoconferencing platform Zoom (San Jose, CA). This approach permitted the course to be offered virtually with synchronous content delivery and real-time interaction between faculty and learners.

Educational Intervention

We developed the didactic portion of the curriculum under the lead of a psychiatrist with expertise in sex therapy and a CAP with training through NYU's Training Program in Human Sexuality, and with the input of several CAP training directors. We incorporated published recommendations from the Summit on Medical School Education in Sexual Health (24), the needs identified for graduate medical education in sexual health (25), and sexuality matters that are specific to children and adolescents with autism (26–28). For the didactics, we provided basic background education in sexual health, as well as a curated resource list. We focused extensively on those issues of sexual development, health, and management relevant to CAPs. We specifically included information in the didactics on how to address common sexual health issues with patients and their families. The didactics were divided into five parts: (1) Sexual health and sexual development: why it matters and what is normal in childhood; (2) Talking about sexual development in children with autism; (3) Normal sexual development in adolescence, pornography, and "porn literacy;" (4) The management of medication-induced sexual dysfunction; and (5) Special sexuality considerations with autism during adolescence.

To support this content, we developed scripts highlighting common issues of sexuality relevant to CAP, including psychotropic-related side effects and sexuality in children with autism. We made digital recordings of two clinicians interacting with three professional actors, yielding 5 video clips with a cumulative running time of 20 min. The mother in the first scenario, and the adolescent son and his father in the second, are all professional actors hired through the Standardized Patient Program of the Yale School of Medicine's Teaching and Learning Center. The actors are experienced in medical settings and followed standardized patient (SP) best practices (29). The clips outlined in **Table 1** were interspersed during a 90-min session comprising didactic and interactive components. We provided a handout with more detail on all didactic components, which also helped accommodate different learning styles. The five video clips and reference handout are included as **Supplementary Materials**.

Outcome Measures

Participants provided demographic information and repeated a survey at baseline and endpoint. At baseline we asked them to provide the first three words or short phrases "that come to mind when discussing sexuality with your adolescent patients" and the three "when discussing sexuality with their parent(s) or guardian(s)." We adapted the *Physician Belief Scale* (30) and the *Patient-Practitioner Orientation Scale* (9) into a 20-item questionnaire tailored to the practice of CAPs. The resulting survey tapped into two common domains in training and education, though is not to be construed as a formal assessment of either: (1) *Skills and Knowledge*, for which respondents indicated how strongly they agree or disagree with 9 statements using a five-point Likert scale; and (2) *Attitudes*, a list of 11 statements similarly coded. Some of the items were reverse-coded to prevent response acquiescence bias.

Ethics Approval

Before starting data collection, we obtained institutional review board approval from the Yale Human Investigations Committee (Protocol # 2000027918). The study was deemed exempt, with completion of the survey representing tacit consent. Learners were encouraged to participate, but informed that their responses were neither mandatory nor relevant to their performance evaluation. They were notified that results of the surveys would not be accessible to faculty responsible for their assessment. In order to track individuals' responses over time, each participant provided a de-identified and anonymous study code.

Data Collection and Statistical Analysis

Participants completed surveys through their preferred, WiFi-enabled personal devices during dedicated time on two dates in May and June 2020. We collected information securely through Qualtrics (Provo, UT), and analyzed data using SPSS version 25 (Armonk, NY).

We compared differences before and after the didactic intervention using paired-*t*-tests and Cohen's *d* effect sizes for continuous variables (global scores on Skills and Knowledge, and on Attitudes). We next compared the survey's 20 individual items using chi square-tests for the 20 categorical items, relying on McNemar's-test to examine changes before and after the intervention. McNemar's-test was used to determine differences on a dichotomous dependent variable between two related groups, and is commonly used to analyze pre-post study

TABLE 1 | Video clips for child and adolescent psychiatry sexual health didactic resource.

Clip	Scene	Content	Duration	
			Min	S
1	Stephanie and young Hannah	Normal sexuality in children	3	40
2	Stephanie and young Hannah, Part 2	Special considerations in children with autism	5	50
3	Bobby and father	Porn literacy	2	30
4	Bobby	Psychotropic-related sexual side effects	2	0
5	Stephanie and Hannah, three years later	Sexuality and safer sex in adolescents with autism	6	15
Total			20	15

designs (31). Finally, we used word cloud generator software (wordclouds.com; Zygomatic Inc., Vianen, The Netherlands) to visually depict students' word choices at baseline.

RESULTS

We approached 20 training programs associated with the AALI network; 15 agreed to participate in one of the dates offered (14 in the US, one in Brazil). Two hundred and nine learners participated in one of the two sessions, and 166 of them (80%) consented to participate and completed the baseline assessment. Some of these learners did not complete the endpoint survey ($n = 23$) or failed to provide a matching unique identifier ($n = 18$). This resulted in a final working sample of 125 participants, yielding a total usable completion rate of 75% (125/143). We compared baseline demographic characteristics between endpoint survey completers ($n = 125$) and non-completers ($n = 41$). Finding no differences ($p > 0.05$ for all contrasts), we restricted analyses to the completer group.

Table 2 summarizes characteristics of these 125 participants and their clinical practice routines regarding sexual health. There was a weak correlation between the overall composite score and years in clinical practice ($r = 0.3$, $p = 0.01$), but not with self-rated views on sexuality. Of note, over two thirds of participants acknowledged inquiring about sexual health only "occasionally," "rarely," or "never." Safer sex practices, sexual activity, pregnancy prevention, and sexually transmitted infections were more commonly addressed than masturbation or specific sexual dysfunctions. Addressing patients' sexual activity with parents or guardians was challenging, particularly for patients who are neuro-atypical or have developmental delays. **Figure 1** provides a visual depiction of participants' perceptions on addressing sexuality with their patients and guardians, with "awkward" and "uncomfortable" leading the way.

The didactic intervention led to measurable improvements after 2 weeks in Skills and Knowledge ($p = 0.004$), Attitudes ($p < 0.001$), and in the overall composite score ($p < 0.001$; **Table 3**). Although statistically and clinically significant, effect sizes were small (Cohen's $d \leq 0.35$). In order to better understand the specific components driving these changes, we conducted a secondary item-level analysis. **Table 4** summarizes these findings, rank ordered by the degree of change from baseline to endpoint. The three items with the greatest improvement were: (a) Availability of developmentally tailored resources; (b) Comfort in addressing sexual development with underage patients; and (c) with parents or guardians of neuroatypical or developmentally disabled patients ($p < 0.001$ for each).

The session was rated highly on a five-point Likert scale ($4.6 +/- 0.7$; **Table 5**. Finally, 116 participants (93%) provided responses to our optional question about the session in general, and about its video-based component in particular. Comments were generally positive, with representative verbatim quotes including the following: "We were very impressed by the quality of the talk, the videos were amazing for our modeling on how to approach sexual issues. I am very glad that we could take part in this class and hope we can keep participating in the future;" "This online multisite approach is a unique and effective contribution to training, particularly given the recent pandemic. Thank you for including our program;" and "The video interactions were particularly helpful in making the concepts 'come alive' and providing actionable clinical examples to emulate and learn from: I will for sure be using your 'electric/mechanical/plumbing' analogies [which refer to arousal/erection//ejaculation] in my own practice, and for that I thank you." There were over a dozen requests to make the teaching materials available, including this representative one: "Videos were great, and it would be useful to have access to them along with a facilitator's guide [*a la* NNCI (National Neuroscience Curriculum Initiative)], so programs could develop their own seminars based off of this one." There were several suggestions for future enhancements, most consistently the use of small break-out groups to increase interactivity. The use of synchronized videoconferencing had the lowest rating on the session evaluation, and the poor phrasing of our question may have introduced too high a threshold to overcome, as we inquired about "Zoom *contributing to* or *enhancing* the training in some way." Despite this, ratings were still on average above 4 ("somewhat agree"), and textual comments were largely positive, noting more of its advantages, particularly the opportunity to interact with learners across institutions: "Loved having multiple sites; think this is great early move toward harnessing this technology."

DISCUSSION

This study was designed to examine: (1) a specialized educational resource on sexual health and its impact on learners' knowledge, skills, and attitudes; (2) the use of videotaped depictions of clinical interactions to complement the module's content; and (3) the deployment of educational content through a multisite initiative using synchronized videoconferencing. The results of our study support the utility of each of the three components.

TABLE 2 | Descriptive characteristics and clinical practice routines of study participants ($n = 125$).

	n	%
Participant characteristics		
Program size (number of CAP trainees)		
≥10	55	44
8 or 9	34	27
≤7	36	29
Sex		
Female	82	66
Male	43	34
Training level		
Practicing CAP	24	19
Fellow	68	54
Resident	33	26
Continuous variables *(M/SD)*		
Years since MD degree	*6.3*	*6.9*
Self-rated views on sexuality (range, 2–10: lower—more conservative; higher—more liberal)	*7.7*	*1.9*
Clinical practice routines		
Prompt: *With regard to your child and adolescent patients, how often do you…*[a]		
Inquire about sexual function?	35	28
Inquire about specific sexual behaviors, such as…		
Safer sex practices	72	58
Sexual activity	69	55
Pregnancy prevention	69	55
Intercourse	60	48
Sexually transmitted infections	58	46
Masturbation	11	9
Inquire about changes in sexual function that may be related to psychotropics?	44	35
Inquire about specific sexual problems, such as…		
Desire	13	10
Orgasm	8	6
Arousal (lubrication, erection)	6	5
Refer young patients to specialists in sexual health, as appropriate?	12	10
Discuss sexual health issues with your young patients' parents or guardians?	16	13
Provide education on sexual health to parents or guardians?	14	11
Provide education on sexual side effects of psychotropics to parents or guardians?	41	32

[a] *Responses refer to number and percentage of participants who responded "Routinely" or "Often" on a given item. Italic values indicate Mean and standard deviation.*

Sex Ed 201: An Educational Resource Tailored for Child and Adolescent Psychiatrists

In keeping with experiences reported in the medical education literature in medicine (9–13), including psychiatry (32, 33), the CAP participants in our study felt uneasy and insufficiently prepared to address issues of sexuality in their clinical practice. Although realizing how "important" and "necessary" the topic was, they almost universally felt "awkward" or "uncomfortable" in broaching it directly with patients and families. We found that a one-time education session of 90 min led to improvements in knowledge, skills and attitudes measurable after 2 weeks.

We developed the education module mindful of the specialty's specific needs, and in particular that of presenting information in an appropriate way to children and adolescents of different ages and developmental needs, and with their parents or guardians as clinically indicated. We found wide variability in clinicians' prior knowledge and education regarding sexual health, and inconsistency in the resources available to them. Indeed, we found particular improvement after the training on concrete knowledge about the availability of developmentally tailored materials, including books, websites, trainings, and others such as those we curated. This finding highlights the need to incorporate easily accessible and up to date resources into sexual health curricula to the extent possible. This is especially relevant for CAPs, who routinely interface with children, adolescents and adults with a broad array of age, language abilities, and developmental differences. We emphasized that addressing sexual health is important for all child and adolescent patients, no matter what diagnosis or (dis)ability they may have, but given time constraints, chose to provide more in-depth education on only one diagnosis. We decided on and incorporated autism-specific content given the growing (and overdue) attention to the importance of sexual health among youth and young adults on the autism spectrum (28, 34).

The CAP training competencies, as outlined by the American Board of Psychiatry and Neurology (35) and by the Accreditation Council for Graduate Medical Education's program requirements (36) include several aspects relevant to sexuality, including among others: psychosexual development, disorders of sexual development, sexual abuse, and sexual orientation. However, sexual function, sexual health, and common sexual dysfunctions tend to be sparely addressed, when addressed at all. There are no clear parameters on what a comprehensive curriculum would entail, or how it could be incorporated into an already overflowing set of training requirements. Moreover, there is a dearth of CAP educators appropriately trained in sexual health. To that end, our initiative provides a concrete step toward greater standardization in education and training (37), as well as material that can be incorporated and adapted "off the shelf" by end users who may otherwise not have ready access to content experts.

Making It Real: Incorporating Simulation With Standardized Patients Into CAP

Simulation with SPs offers learners an opportunity to gain exposure to a wide range of patients and clinical scenarios, and to practice and refine clinical skills in a safe and supportive environment (38). Although widely used in undergraduate medical education, simulation-based training in post-graduate psychiatric training is considerably more limited (39–41). SP use in CAP training is virtually non-existent, partly because

FIGURE 1 | Word cloud based on the prompt "please list words or short phrases that come to mind when discussing sexuality with your adolescent patients [3 words] and/or their parents" [3 words]. $n = 628$ entries, comprising 58 words with 4 or more occurrences each.

TABLE 3 | Outcome change after didactic intervention: sexual health skills and attitudes in child and adolescent psychiatry practice ($n = 125$).

Domain	Before		After		Paired *t* df = 124	*p*	Cohen's d
	M	SD	M	SD			
Overall	66.6	7.2	72.1	9.1	8.19	<0.001	0.35
Skills and knowledge	28.0	5.4	31.2	6.0	2.96	0.004	0.24
Attitudes	37.8	4.4	39.1	6.1	6.30	<0.001	0.07

of the additional practical, legal, and ethical considerations inherent to working with underage actors (42). Still, there are several informative examples of simulation-based psychiatric training using SPs in other fields. For example, performance on adolescent suicide risk assessment among residents in pediatrics objectively improved after using an SP-based learning module (43).

By incorporating videotaped depictions of experienced clinicians interacting with SPs, we were able to offer realistic portrayals of encounters likely to be faced by CAPs in their clinical practice. Learners were able to see the techniques and actual words used to demystify sexual health and turn it into a routine part of outpatient visits. In an ideal setting, learners would be able to practice these skills during face-to-face interactions with SPs. However, such an approach would be logistically taxing, particularly for as many participants and given the challenges to provide SPs around as many sites with varying levels of local resources and expertise. Instead, the availability of enduring learning materials such as ours allows for a series of

TABLE 4 | Item analysis: sexual health skills and attitudes in child and adolescent psychiatry practice ($n = 125$).

Item	Prompt	Domain	Didactic intervention[a]				
			Before		After		p^b
			n	%	*n*	%	
1	I have resources to use in support of evaluating, treating and educating young patients regarding their sexual health	S/K	0	0	89	71	<0.001
2	I am comfortable addressing sexual development issues with my underage patients	S/K	61	49	92	74	<0.001
3	I am comfortable addressing sexual development issues with the parents or guardians of my patients (including adults) who are neuro-atypical and/or developmentally disabled	S/K	32	26	70	56	<0.001
4	I approach psychiatric and sexual health problems concurrently	S/K	33	26	54	43	0.001
5	I know the risk of sexual side effects for the medications I prescribe	S/K	33	26	54	43	0.001
6	*Exploring sexual health issues with an underage patient's parents or guardians causes me discomfort	A	35	28	51	41	0.007
7	I address sexual health problems even if only by assessing for their presence and referring to other providers	S/K	38	30	59	47	0.005
8	I recognize when my patients experience a sexual problem	S/K	45	36	63	50	0.01
9	*There are so many issues to be investigated when seeing a patient that I do not always consider sexual health factors	A	12	10	25	20	0.011
10	I routinely address sexual health issues with all of my adolescent patients	S/K	39	31	54	43	0.014
11	*My sex/gender/sexual identity interferes with my ability to treat patients	A	107	86	94	75	0.015
12	*My patients do not want me to investigate sexual health problems	A	93	74	104	83	ns
13	Sexual health has an important impact on general and mental health	A	118	94	123	98	ns
14	*Talking about sexual health issues causes more trouble than it is worth	A	114	91	113	90	ns
15	*Regardless of what I say, patients will discontinue medications if they believe them to have sexual side effects	A	72	58	77	62	ns
16	*I am too pressed for time to routinely investigate sexual health issues	S/K	50	40	59	47	ns
17	*Patients with sexual concerns will spontaneously bring them up if they want me to know	A	92	74	93	74	ns
18	*Exploring sexual health issues with neuro-atypical and/or developmentally disabled patients causes me discomfort	A	44	35	51	41	ns
19	*I find it challenging to find developmentally appropriate information regarding sexual health for my pediatric patients and their parents or guardians	A	18	14	29	23	ns
20	*If I deal with the sexual health issues of minors, I will lose patients	A	110	88	111	89	ns

A, attitudes; S/K, skills and knowledge.

[a] *Responses refer to number and percentage of participants who responded "Strongly agree" or "Agree" on a given item; for reverse-coded items (noted with an asterisk), participants responded "Strongly disagree," or "Disagree."*

[b] *Calculated with the McNemar–test.*

TABLE 5 | Session evaluation ($n = 125$).

	M	SD
Video examples exemplifying/reinforcing the didactic content	4.7	0.6
Addressing its stated objectives	4.6	0.6
Overall usefulness/applicability/relevance?	4.6	0.6
Being interested in other didactic offerings using a similar approach	4.6	0.6
Likelihood to recommend this training to other peers	4.6	0.7
Overall educational content/"bang for your buck"	4.5	0.7
Zoom contributing or enhancing the training in some way	4.2	0.9
Summary rating	4.6	0.7

Likert scale: Strongly agree, 5; Somewhat agree, 4; Neither agree nor disagree, 3; Somewhat disagree, 2; Strongly disagree, 1.

consistent and standardized stimuli, which can then be adapted locally and incorporated into practice by individual learners or training programs.

We consider that the availability of such resources, especially if part of broader materials, could strengthen learning opportunities across the discipline. For example, curated content incorporating SP depictions could be useful to ensure consistent training across training sites, regardless of their size or local resources. Aspects of clinical practice with high public health impact and limited local expertise (such as adolescent substance abuse) could be natural topics to consider as next steps. The challenges to incorporate underage SPs notwithstanding, we are committed to expanding simulation in CAP. We are not alone in seeing the potential that could be unleashed: "The ability of mental health simulation to bridge the gap between education and clinical practice, alongside its potential for interprofessional education and initial evidence supporting its effectiveness, merit its inclusion as a key educational tool in providing better care for mental health needs…Mental health simulation is poised to have a positive effect should the necessary support, funding, and progressive thinking be applied" (44).

The Zoom Where It Happens: Leveraging a New Technology to Enhance CAP Training

The timing of our scheduled training session vis-á-vis the COVID-19 pandemic forced us to move from what had initially been designed as a single site initiative to one that incorporated 15 peer institutions. Were it not for the pandemic, it is unlikely that we would have conceptualized this effort as one delivered through synchronous videoconferencing. The approach provided several unique advantages: a broader reach in the number and geographic extraction of participants; training consistency across sites; interaction in real time with content experts and fellow learners; and logistic ease in securing curricular content and experienced faculty. Our resort to this means of content delivery is not new (45), and we are in good company with other medical specialties that adapted rapidly to the limitations brought on by the pandemic [e.g., (46)].

Apart from those aspects of sexual health we set out to study, we consider this report a proof of principle for a novel education model in CAP. The combination of a secure virtual platform for synchronous videoconferencing, and the recruitment reach available through a network such as AALI, together offer entirely new opportunities. Given the relatively small size of the field, and the limited number of faculty experienced in a range of subspecialized topics, we believe that CAP could stand to benefit from similar efforts focused on strategic content areas.

Limitations

We recognize several limitations to our study. First, our sample was modest in size and varied in its characteristics, which may limit its representativeness and generalizability to other training programs within, and particularly outside of the US; second, we recognize the possibility of a social desirability bias: learners may have answered the surveys more favorably at the second time point; third, we did not have a control group, such as of learners exposed to the lecture content but not to the videos, which could have helped identify active components of the intervention; fourth, we recognize that even as we measured changes in attitudes and knowledge 2 weeks after the intervention, we do not know whether effects will prove to be durable, or whether they will translate into actual clinical practice. A single exposure may not be sufficient to have an enduring effect; a spiral curriculum could be beneficial, wherein repeat encounters with sexual health content as relevant to CAP would reinforce previous learning. Compounding these measurement limitations is the fact that our primary outcome measure is a practical adaptation that does not have the strong empirical validation and support we would have optimally worked with. Finally, in harnessing Zoom at the early stages of the pandemic, we had much to learn. As aptly noted by one of the participants: "We have miles to go before we sleep regarding taking optimal advantage of this approach, which we absolutely should." In particular, future iterations of this approach should carefully balance how best to incorporate interactive components, including optimal use of break-out rooms.

In summary, our study shows that a sexual health curriculum enriched by video-based examples can lead to measurable improvement in outcomes pertinent to the clinical practice of CAP. These educational materials are available for distribution, use and adaptation by local instructors. Our study also provides proof-of-principle for the use of multisite educational initiatives through synchronized videoconferencing.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

This study was approved by The Yale Human Investigations Committee (Protocol # 2000027918). It was deemed exempt, with survey completion standing for tacit consent. Written informed consent was not required for this study, in accordance with national legislation and institutional requirements.

AUTHOR CONTRIBUTIONS

LD and EG designed the sexual health curriculum and wrote the scripts. LD, EG, and AM worked with standardized patients in developing the videotaped depictions, designed the study, and drafted the first version of the manuscript. AM took the lead in analyzing the data and is responsible for the integrity of the data and analyses. All authors recruited learners at their respective training sites and participated in the education module, reviewed and contributed to working drafts, and approved the final, submitted version.

FUNDING

Supported by the Riva Ariella Ritvo Endowment at Child Study Center, Yale School of Medicine, and by NIMH R25 MH077823, Research Education for Future Physician-Scientists in Child Psychiatry.

ACKNOWLEDGMENTS

We appreciate the professional actors' contributions and the learners' engaged participation. We are grateful to Barbara Hildebrand of the Standardized Patient Program, Teaching and Learning Center, and Zsofia Leranth-Nagy of the Youth Standardized Patient Program, Child Study Center, Yale School of Medicine.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2020.593101/full#supplementary-material

REFERENCES

1. WHO. *Defining Sexual Health*. WHO. (2002). Available online at: https://www.who.int/reproductivehealth/publications/sexual_health/defining_sh/en/ (accessed July 6, 2020).
2. Office of the Surgeon General (US), Office of Population Affairs (US). *The Surgeon General's Call to Action to Promote Sexual Health and Responsible Sexual Behavior*. Rockville, MD: Office of the Surgeon General (2001). (Publications and Reports of the Surgeon General). Available online at: http://www.ncbi.nlm.nih.gov/books/NBK44216/ (accessed July 6, 2020).
3. Hogben M, Ford J, Becasen JS, Brown KF. A systematic review of sexual health interventions for adults: narrative evidence. *J Sex Res*. (2015) 52:444–69. doi: 10.1080/00224499.2014.973100
4. Information NC for B, Pike USNL of M 8600 R, MD B, USA 20894. Sexual health interventions: a meta-analysis. *Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews*. Centre for Reviews and Dissemination (2014). Available online at: https://www.ncbi.nlm.nih.gov/books/NBK292511/ (accessed July 26, 2020).
5. Ford JV, Ivankovich MB, Douglas JM, Hook EW, Barclay L, Elders J, et al. The need to promote sexual health in America: a new vision for public health action. *Sex Transm Dis*. (2017) 44:579–85. doi: 10.1097/OLQ.0000000000000660
6. Swartzendruber A, Zenilman JM. A national strategy to improve sexual health. *JAMA*. (2010)304:1005–6. doi: 10.1001/jama.2010.1252
7. Atlantis E, Sullivan T. Bidirectional association between depression and sexual dysfunction: a systematic review and meta-analysis. *J Sex Med*. (2012) 9:1497–507. doi: 10.1111/j.1743-6109.2012.02709.x
8. Ishak W, editor. *The Textbook of Clinical Sexual Medicine*. Springer International Publishing (2017). p. 347–9 (Evaluation and treatment of substance-/medication-induced sexual dysfunction). Available online at: https://www.springer.com/gp/book/9783319525389 (accessed August 8, 2020).
9. Tsimtsiou Z, Hatzimouratidis K, Nakopoulou E, Kyrana E, Salpigidis G, Hatzichristou D. Original research—education: predictors of physicians' involvement in addressing sexual health issues. *J Sex Med*. (2006) 3:583–8. doi: 10.1111/j.1743-6109.2006.00271.x
10. Merrill J, Laux L, Thornby J. Why doctors have difficulty with sex histories. *South Med J*. (1990) 83:613–7. doi: 10.1097/00007611-199006000-00004
11. Rubin ES, Rullo J, Tsai P, Criniti S, Elders J, Thielen JM, et al. Best practices in North American pre-clinical medical education in sexual history taking: consensus from the summits in medical education in sexual health. *J Sex Med*. (2018) 15:1414–25. doi: 10.1016/j.jsxm.2018.08.008
12. Faulder GS, Riley SC, Stone N, Glasier A. Teaching sex education improves medical students' confidence in dealing with sexual health issues. *Contraception*. (2004) 70:135–9. doi: 10.1016/j.contraception.2004.03.010
13. Shindel AW, Baazeem A, Eardley I, Coleman E. Sexual health in undergraduate medical education: existing and future needs and platforms. *J Sex Med*. (2016) 13:1013–26. doi: 10.1016/j.jsxm.2016.04.069
14. Skelton JR, Matthews PM. Teaching sexual history taking to health care professionals in primary care. *Med Educ*. (2001) 35:603–8. doi: 10.1046/j.1365-2923.2001.00926.x
15. Shindel AW, Ando KA, Nelson CJ, Breyer BN, Lue TF, Smith JF. Medical student sexuality: how sexual experience and sexuality training impact U.S. and Canadian medical students' comfort in dealing with patients' sexuality in clinical practice. *Acad Med*. (2010) 85:1321–30. doi: 10.1097/ACM.0b013e3181e6c4a0
16. Goldman JDG. An exploration in health education of an integrated theoretical basis for sexuality education pedagogies for young people. *Health Educ Res*. (2011) 26:526–41. doi: 10.1093/her/cyq084
17. Chin HB, Sipe TA, Elder R, Mercer SL, Chattopadhyay SK, Jacob V, et al. The effectiveness of group-based comprehensive risk-reduction and abstinence education interventions to prevent or reduce the risk of adolescent pregnancy, human immunodeficiency virus, and sexually transmitted infections: two systematic reviews for the Guide to Community Preventive Services. *Am J Prev Med*. (2012) 42:272–94. doi: 10.1016/j.amepre.2011.11.006
18. Hall KS, Sales JM, Komro KA, Santelli J. The state of sex education in the United States. *J Adolesc Health*. (2016) 58:595–7. doi: 10.1016/j.jadohealth.2016.03.032
19. Holland-Hall C, Quint EH. Sexuality and disability in adolescents. *Pediatr Clin North Am*. (2017) 64:435–49. doi: 10.1016/j.pcl.2016.11.011
20. Loftin R. Sex education, sexual health, and autism spectrum disorder. *Pediatr Ther*. (2015) 5:1. doi: 10.4172/2161-0665.1000230
21. Brown-Lavoie SM, Viecili MA, Weiss JA. Sexual knowledge and victimization in adults with autism spectrum disorders. *J Autism Dev Disord*. (2014) 44:2185. doi: 10.1007/s10803-014-2093-y
22. Gill M. Sex can wait, masturbate: the politics of masturbation training. *Sexualities*. (2012) 15:472–93. doi: 10.1177/1363460712439655
23. Murphy NA, Elias ER. Sexuality of children and adolescents with developmental disabilities. *Pediatrics*. (2006) 118:398–403. doi: 10.1542/peds.2006-1115
24. University of Minnesota Program in Human Sexuality. *Summit on Medical School Education in Sexual Health, Papers*. Program in Human Sexuality, University of Minnesota (2018). Available online at: https://www.sexualhealth.umn.edu/education-and-training/summit-medical-school-education-sexual-health/papers (accessed August 3, 2020).
25. Parish SJ, Clayton AH. Continuing medical education: sexual medicine education: review and commentary (CME). *J Sex Med*. (2007) 4:259–68. doi: 10.1111/j.1743-6109.2007.00430.x
26. Chan J, John RM. Sexuality and sexual health in children and adolescents with autism. *J Nurse Pract*. 8:306–15. doi: 10.1016/j.nurpra.2012.01.020
27. Lehan Mackin M, Loew N, Gonzalez A, Tykol H, Christensen T. Parent perceptions of sexual education needs for their children with autism. *J Pediatr Nurs*. (2016) 31:608–18. doi: 10.1016/j.pedn.2016.07.003
28. Pugliese CE, Ratto AB, Granader Y, Dudley KM, Bowen A, Baker C, et al. Feasibility and preliminary efficacy of a parent-mediated sexual education curriculum for youth with autism spectrum disorders. *Autism*. (2020) 24:64–79. doi: 10.1177/1362361319842978
29. Lewis KL, Bohnert CA, Gammon WL, Hölzer H, Lyman L, Smith C, et al. The association of standardized patient educators (ASPE) standards of best practice (SOBP). *Adv Simul*. (2017) 2:10. doi: 10.1186/s41077-017-0043-4
30. Ashworth CD, Williamson P, Montano D. A scale to measure physician beliefs about psychosocial aspects of patient care. *Soc Sci Med*. (1984) 19:1235–8. doi: 10.1016/0277-9536(84)90376-9
31. Adedokun OA, Burgess WD. Analysis of paired dichotomous data: a gentle introduction to the McNemar test in SPSS. *J MultiDisc Eval.* (2011) 8:125–31. Available online at: https://journals.sfu.ca/jmde/index.php/jmde_1/article/view/336 (accessed October 21, 2020).
32. Rele K, Wylie K. Management of psychosexual and relationship problems in general mental health services by psychiatry trainees. *Int J Clin Pract*. (2007) 61:1701–4. doi: 10.1111/j.1742-1241.2007.01455.x
33. Hegde D, Sreedaran P, Pradeep J. Challenges in taking sexual history: a qualitative study of Indian postgraduate psychiatry trainees. *Indian J Psychol Med*. (2018) 40:356–63. doi: 10.4103/IJPSYM.IJPSYM_64_18
34. Cheak-Zamora NC, Teti M, Maurer-Batjer A, O'Connor KV, Randolph JK. Sexual and relationship interest, knowledge, and experiences among adolescents and young adults with autism spectrum disorder. *Arch Sex Behav*. (2019) 48:2605–15. doi: 10.1007/s10508-019-1445-2
35. American Board of Psychiatry and Neurology. *Child and Adolescent Psychiatry Core Competencies Outline*. (2011). Available online at: https://www.abpn.com/wp-content/uploads/2015/02/2011_core_CAP_MREE.pdf (accessed August 2, 2020).
36. Accreditation Council for Graduate Medical Education. *ACGME Program Requirements for Graduate Medical Education in Child and Adolescent Psychiatry*. (2020). Available online at: https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/405_ChildAdolescentPsychiatry_2020_TCC.pdf?ver=2020-06-19-130559-823 (accessed August 2, 2020).
37. Jannini EA, Reisman Y. Medicine without sexual medicine is not medicine: an MJCSM and ESSM petition on sexual health to the political and university authorities. *J Sex Med*. (2019) 16:943–5. doi: 10.1016/j.jsxm.2019.04.001
38. Rosen KR. The history of medical simulation. *J Crit Care*. (2008) 23:157–66. doi: 10.1016/j.jcrc.2007.12.004
39. Brenner AM. Uses and limitations of simulated patients in psychiatric education. *Acad Psychiatry*. (2009) 33:112–9. doi: 10.1176/appi.ap.33.2.112

40. Hodges BD, Hollenberg E, McNaughton N, Hanson MD, Regehr G. The psychiatry OSCE: a 20-year retrospective. *Acad Psychiatry*. (2014) 38:26–34. doi: 10.1007/s40596-013-0012-8
41. Plakiotis C. Objective structured clinical examination (OSCE) in psychiatry education: a review of its role in competency-based assessment. *Adv Exp Med Biol*. (2017) 988:159–80. doi: 10.1007/978-3-319-56246-9_13
42. Budd N, Andersen P, Harrison P, Prowse N. Engaging children as simulated patients in healthcare education. *Simul Healthc*. (2020) 15:199–204. doi: 10.1097/SIH.0000000000000452
43. Fallucco EM, Hanson MD, Glowinski AL. Teaching pediatric residents to assess adolescent suicide risk with a standardized patient module. *Pediatrics*. (2010) 125:953–9. doi: 10.1542/peds.2009-2135
44. Attoe C, Kowalski C, Fernando A, Cross S. Integrating mental health simulation into routine health-care education. *Lancet Psychiatry*. (2016) 3:702–3. doi: 10.1016/S2215-0366(16)30100-6
45. Chipps J, Brysiewicz P, Mars M. A systematic review of the effectiveness of videoconference-based tele-education for medical and nursing education. Worldviews Evid Based Nurs. (2012) 9:78–87. doi: 10.1111/j.1741-6787.2012.00241.x
46. Hilburg R, Patel N, Ambruso S, Biewald MA, Farouk SS. Medical education during the Coronavirus disease-2019 pandemic: learning from a distance. *Adv Chronic Kidney Dis*. (2020). doi: 10.1053/j.ackd.2020.05.017. [Epub ahead of print].

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

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 08 January 2021
doi: 10.3389/fpsyt.2020.616239

From Learning Psychiatry to Becoming Psychiatrists: A Qualitative Study of Co-constructive Patient Simulation

Andrés Martin[1,2,3*], *Indigo Weller*[4], *Doron Amsalem*[5,6], *Ayodola Adigun*[1,6], *Debbie Jaarsma*[3], *Robbert Duvivier*[3,7] and *Marco Antonio de Carvalho-Filho*[3,8]

[1] Child Study Center, Yale School of Medicine, New Haven, CT, United States, [2] Standardized Patient Program, Teaching and Learning Center, Yale School of Medicine, New Haven, CT, United States, [3] Center for Educational Development and Research in Health Sciences (CEDAR), LEARN, University Medical Center Groningen, Groningen, Netherlands, [4] Bioethics Program, Harvard University, Cambridge, MA, United States, [5] Tel-Aviv University Faculty of Medicine, Ramat-Aviv, Israel, [6] Mental Health Services, Columbia University Irving Medical Center, New York, NY, United States, [7] Parnassia Psychiatric Institute, The Hague, Netherlands, [8] School of Medical Sciences, University of Minho, Braga, Portugal

Objectives: Co-constructive patient simulation (CCPS) is a novel medical education approach that provides a participatory and emotionally supportive alternative to traditional supervision and training. CCPS can adapt iteratively and in real time to emergent vicissitudes and challenges faced by clinicians. We describe the first implementation of CCPS in psychiatry.

Methods: We co-developed clinical scripts together with child and adolescent psychiatry senior fellows and professional actors with experience performing as simulated patients (SPs). We conducted the simulation sessions with interviewers blind to the content of case scenarios enacted by the SPs. Each hour-long simulation was followed by an hour-long debriefing session with all participants. We recorded and transcribed case preparation, simulation interactions, and debriefing sessions, and analyzed anonymized transcripts through qualitative analysis within a constructivist framework, aided by NVivo software.

Results: Each of six CCPS sessions was attended by a median of 13 participants (range, 11–14). The first three sessions were conducted in person; the last three, which took place during the COVID-19 pandemic, via synchronized videoconferencing. Each of the sessions centered on clinically challenging and affectively charged situations informed by trainees' prior experiences. Through iterative thematic analysis we derived an alliterating "9R" model centered on three types of Reflection: (a) *in* action/"while doing" (Regulate, Relate, and Reason); (b) *on* action/"having done" (Realities, Restraints, and Relationships); and (c) *for* action/"will be doing" (with opportunities for Repair and Reaffirmation).

Conclusions: CCPS is an experiential approach that fosters autonomous, meaningful, and individually tailored learning opportunities. CCPS and the 9R model for reflective practice can be effectively applied to psychiatry and have the potential to contribute uniquely to the educational needs of its trainees and practitioners.

Keywords: medical education, patient simulation, reflective practice, community of practice, psychiatry training

OPEN ACCESS

Edited by:
Mark Hanson,
University of Toronto, Canada

Reviewed by:
Jeffrey I. Hunt,
Brown University, United States
Nancy McNaughton,
University of Toronto, Canada

****Correspondence:***
Andrés Martin
andres.martin@yale.edu

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *11 October 2020*
Accepted: *10 December 2020*
Published: *08 January 2021*

Citation:
Martin A, Weller I, Amsalem D, Adigun A, Jaarsma D, Duvivier R and de Carvalho-Filho MA (2021) From Learning Psychiatry to Becoming Psychiatrists: A Qualitative Study of Co-constructive Patient Simulation. Front. Psychiatry 11:616239. doi: 10.3389/fpsyt.2020.616239

> "As Kubie describes in his timeless paper on the retreat from patients (1), there is a difference between learning psychiatry and the process of becoming a psychiatrist. The latter is not something that a learner can gain only from books, lectures or abstract conversations, but rather from living "…within themselves the turmoil of personal growth and change, induced by repeated experiences of interacting with and adjusting to patients as they change "" (2).

> "The ability of mental health simulation to bridge the gap between education and clinical practice, alongside its potential for interprofessional education and initial evidence supporting its effectiveness, merit its inclusion as a key educational tool in providing better care for mental health needs…This integration should span undergraduate and postgraduate education, and continuing professional development across health-care settings and professions. Mental health simulation is poised to have a positive effect should the necessary support, funding, and progressive thinking be applied" (3).

The use of simulation in psychiatric education and training is a relatively new endeavor when compared to other branches of medicine. Standardized patients were first introduced into medical education by neurologist Howard Barrows in 1963 (4), with simulation in evaluation dating back to 1975, when the Objective Structured Clinical Examination (OSCE) was first described by Ronald Harden (5). Psychiatric OSCEs began to be implemented and studied systematically in the mid 1990's. This effort was led by the Psychiatric Skills Assessment Project (PSAP) group at the University of Toronto, which was later codified by Brian Hodges (6) in a milestone 2002 special issue of *Academic Psychiatry* entirely dedicated to the psychiatric OSCE.

Standardized patient simulation (SPS) in psychiatry has a number of applications in education, outside of their role in OSCEs. For example, through SPS learners can gain exposure to a wider variety of patients and clinical scenarios, and educators can reliably assess specific diagnostic or therapeutic skills (7). SPS can also provide education and assessment opportunities in graduate medical education (GME) in psychiatry, following the broader education transition from a milestone-based approach to a competency-based medical education (CBME) paradigm based on entrustable professional activities (EPAs) (8). There are a few informative examples of SPS-based psychiatric training modules in GME, including for suicide risk assessment among pediatrics residents (9), or for sexual health education specifically tailored for child and adolescent psychiatry (CAP) (10).

Despite these and other applications of SPS in psychiatry, Brenner (11) has cautioned that patient simulation may not be as effective in helping trainees refine empathetic and psychotherapeutic skills and cultivate a collaborative clinical attitude. To the contrary, we propose that the uniquely interpersonal nature of psychiatry lends itself for an especially robust application of simulation. We buttress this position through the first application to psychiatry of the recently described co-constructive patient simulation (CCPS) model (12). CCPS is "a novel approach to engage learners in a way that equally values the cultivation of their professional competencies alongside a compassionate reckoning of their challenges during medical education. The model encourages shared learning guided by the specific needs of the learners themselves, rather than the pedagogical assumptions of their instructors" (12).

A recent review (13) of simulation in undergraduate medical education (UGME) in psychiatry identified 63 studies, 48 of which included SPS. The authors applied Kolb's Learning Cycle (14) to the retrieved studies, and found that although all studies provided a concrete learning experience (Stage 1), only 19 included opportunities for reflective observation (Stage 2), 2 for abstract conceptualization (Stage 3), and just a single study for active experimentation (the final Stage 4). CCPS is experimental, experiential, and incorporates reflective practice (15) by design. As a group-based exercise, CCPS may foster the development of a community of practice (CoP) (16, 17), in which participants work together to solve a common problem (*engagement*); try to determine how an expert—or their future, more experienced selves— would solve the problem *(imagination)*; and, lastly, seek creative solutions based on shared values, which can then be enacted in accordance with the personality and style of each learner (*alignment*).

We hypothesized that CCPS can help learners develop their professional identities, both as more reflective practitioners and as a community of practice—in short, to advance their growth in *becoming* psychiatrists.

METHODS

Co-constructive Patient Simulation

We developed and have previously described CCPS (12). In summary, CCPS is a learner-centered and experiential approach in which a designated learner (hereafter the "clinician") creates a case script based on a challenging clinical encounter faced during training or clinical practice (18, 19). The case script is then used by a professional actor with experience working as a simulated patient (SP) in medical settings. Following established best practices (20), SPs are able to bring to life a wide array of clinical situations. A supervisor with experience in the CCPS model is involved in the creation and editing of the case script, and in the development of the simulated case. During the preparation of the script, learning goals are jointly elaborated and refined by the triad of clinician, supervisor, and actor. Case preparation includes a rehearsal, during which the SP can optimize the accuracy of their portrayal, and in which the clinician has an opportunity to re-enact and further reflect on the challenging scenario. In this context, only the clinician, the supervisor and the SP are privy to the specific details of the case. Following creation and rehearsal of the case, two fellow learners (peers or blinded supervisors, hereafter "interviewers") with no prior knowledge, apart from a door note with brief background information of the case, will go on to interview the patient embodied by the SP. The clinical encounter is followed by a group debriefing session involving all learners: beginning with the interviewers' experiences, followed by the accounts of the clinician and peer learners, and ending with that of the de-rolled SP.

Study Participants

We conducted a series of six simulation sessions over as many months. Participants were physicians enrolled in the final year of their ACGME-accredited fellowship program in child

and adolescent psychiatry (CAP) at the Child Study Center of the Yale School of Medicine. In collaboration with the fellowship program's training director, the project was designed to provide a formative, rather than a summative educational opportunity. As such, it was intended to consolidate and refine advanced communication, diagnostic and psychotherapeutic skills gained during postgraduate training in psychiatry residency and CAP fellowship.

Data Collection, Qualitative Analysis, and Theoretical Framework

We conducted simulation sessions with interviewers blind to the content of the case scenarios. Each hour-long simulation was followed by an hour-long debriefing session with all participants. Participants were aware that all components of each session (preparation, clinical interaction, and debriefing) were recorded and transcribed verbatim. Deidentified transcripts were then uploaded for software-supported analysis using NVivo 12 (QSR International, Melbourne, Australia).

We analyzed the transcripts using thematic analysis (21, 22), which provides theoretical freedom and flexibility to identify commonalities, and in which writing and analyzing data occur recursively alongside one another. Thematic analysis includes a rich and detailed account of the data and is considered an *inductive* approach insofar as it builds from data up to theory, rather than moving from pre-existing theory down into supporting data, as would be the case in a deductive approach. Our analyses were framed within a constructivist framework, which welcomes and encourages attention to *reflexivity* (23) or the investigators' personal and subjective views. Two authors (AM, IW) worked independently to identify and compare codes before removing redundancies, sharing them with the other investigators for further refinement, and finalizing them into a joint codebook of overarching themes until reaching *theoretical sufficiency* (24), the point at which additional data does not contribute further to the development of a given theme, or to the creation of a new one. Each key theme was supported by multiple quotes. In keeping with the tenets of participatory research (25), we value the perspective of all involved learners, and invited them to review and comment on our final codes, overarching conclusions, and manuscript draft.

We used Donald Schön's classic work on reflective practice (15) as a theoretical framework (26). This approach allowed us to consider: (A) Reflection *in* action, the metacognitive understanding of what is being done while doing it, and that allows behavioral modulation and course correction in real time; (B) Reflection *on* action, the reappraisal of performance after it took place, with a quest to understand what, how, and why it did or did not work; and (C) Reflection *for* action, the anticipation of future performance, with a deliberate search for practical, cognitive, or emotional points of improvement. We benefited for the visual depiction of our model from the application of Schön's theory to the ontology of design (27), through which the three stages of reflection respectively correspond to: the actual world (*as experienced*; "*while doing*"); to the world as understood and made sense of (as *interpreted*, "*having done*"); and the world as prepared for (as *anticipated*, "*will be doing*").

Ethics Approval

We obtained institutional review board approval from the Yale Human Investigations Committee (Protocol # 2000026241). Trainees were encouraged to participate but informed that their participation was neither mandatory nor relevant to their fellowship performance evaluation. They were aware that sessions would be conducted as part of a research project. All participants consented to participate in the study.

RESULTS

We invited all 12 graduating CAP fellows in the class of 2020 to participate, with 11 (92%) of them joining. Other participants included seven different professional actors (one for each session, except for the final one, which involved two SPs for a father-son scenario), and four supervisors. The latter included three individuals not previously known to the trainees: a physician with expertise in medical education and no formal training in psychiatry (MC), a psychiatrist with experience working with SPs (DA), and an expert in narrative medicine (IW). The fourth, a child psychiatrist and medical educator well known to the fellows as their supervisor and associate training director (AM), served as blinded interviewer in two of the six sessions. Each of the six sessions included a median of 13 participants (range, 11–14); fellows attended a median of five sessions each (range, 3–6).

Clinical Case Scenarios

Topics that are difficult to openly talk about proved especially appropriate for the CCPS model: without overt guidance or solicitation, the scripts developed by learners in this series involved medical errors (whether actual or perceived); racial tensions, including implicit bias and overt racism; inter-professional conflict; transphobia; patient-on-provider violence; sexual health; and the sharing of vulnerability and personal imperfections in the clinical setting. We summarize the scenarios and clinical tasks for the six-case series in **Table 1**.

Six clinicians each developed a detailed case script. As a representative example, the script for the second case in **Table 1** is included as **Supplementary Material**. For illustrative purposes, that same case is deconstructed in **Table 2** into the six distinct constituent phases of the CCPS model.

The 9-R Model

Through iterative thematic analysis, we developed an alliterating "9R" model depicted in **Figure 1**, the components of which we go on to describe in turn. Reflection is placed at the center of the model, as it is by reflecting on the simulation session and connecting it with previous and likely future experiences that the entire CCPS exercise is set in motion.

A. Reflection *in* action: the world as experienced ('while doing')

The left half of **Figure 1** has three distinct phases flowing out of Reflection and streaming back into it: (1) Regulate; (2) Relate;

TABLE 1 | Series of co-constructive patient simulations in psychiatry.

Session	Case scenario	Clinical task
I	Initial outpatient appointment for a young father at imminent suicide risk	Conduct a risk assessment and act accordingly
II	HIV-positive staff member files an incident report after being attacked by an adolescent patient	Determine what reporting requirements may apply
III	Hospitalized adolescent discloses physical abuse and being compelled to traffic drugs	File a report with child protective services
IV	Sentinel event and xenophobia during Inpatient hospitalization at the time of the COVID-19 pandemic	Respond to a parent's request to file a complaint
V	Difficult to engage adolescent discloses a recent rape and early pregnancy	Refer patient to appropriate clinical care at an obstetrics-gynecology clinic
VI	Sexual health discussions with a teenager, his developmentally impaired twin brother, and their father	Address sexual side effects of psychotropics; provide counseling on sexual health for a non-verbal adolescent with autism

Sessions 1–3 were conducted in person; sessions 4–6 through synchronous videoconferencing using Zoom.

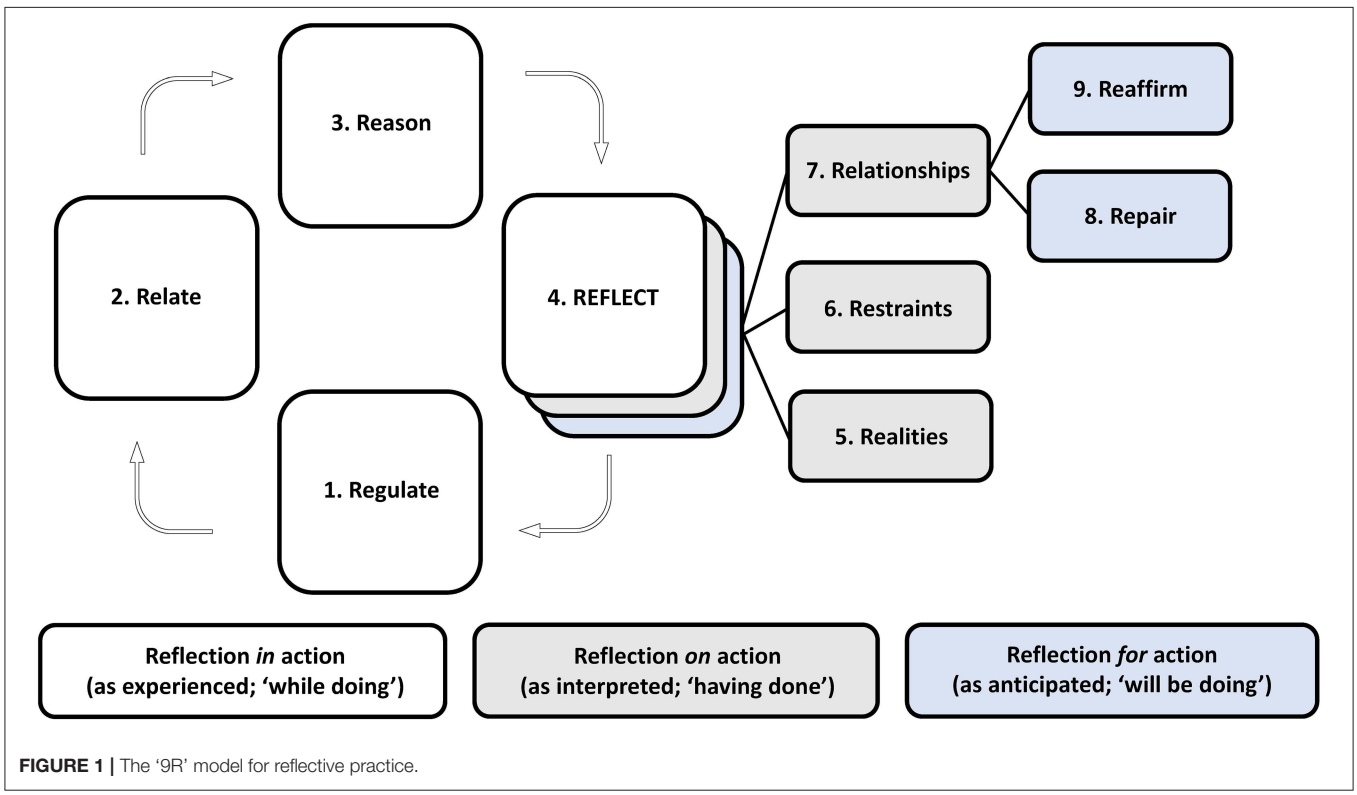

FIGURE 1 | The '9R' model for reflective practice.

and (3) Reason—terms that we adapted from Bruce Perry's neurosequential model of therapeutics (28).

Supporting quotations in this section and the two that follow are attributed using the convention: *Session* (I–VI), followed by *Participant* (1, 2, 3, *n*); the letter "S" is appended at the end when the speaker is a supervisor; the letters "SP" when a simulated patient.

1. Regulate: *don't go limbic*

We encouraged clinicians to think back to emotionally charged and challenging patient interactions when considering experiences to base their scripts on. Clinicians crafted cases in which actors expressed emotions that included, among many others: anger, contempt, disgust, resentment, fear, pity, reluctance, sadness, suspicion, and raw emotional intensity. Interviewing clinicians had a dual task before them: to both welcome and muffle emotional extremes in their patients as much as in themselves in order to proceed with the specific task at hand. Two of the interviewers described the initial moments of the encounter as ethereal and almost dreamlike:

> I think I was trying to moderate her [the SP's] high tone and missing out some details in the process. It was all very volatile, like going up, and down trying to contain her affect. The feelings were really long lasting: the mix of confusion, of containing her aggression, anger, and shame. And it felt at the debriefing session like I was still living in a fog. I couldn't really process it all, not until now (II.4).

> At some point, the tension was so palpable that I felt the background drop off, and it had become just him and me. It was too hot, back off: come back to it when the affect is down (III.1).

TABLE 2 | Development of a co-constructive patient simulation session in psychiatry: an applied case example (Case II from **Table 1**).

Phase	Applied case example
I. Clinical encounter	• During an initial encounter, a moonlighting clinician (CL) attempts to establish an empathetic role with a staff member (SM), a bemoaning, distrusting, sporadically-coughing, grievance-seeking female, with an undisclosed HIV-positive status. • SM is demanding to speak to a "higher-up," after being assaulted by a male, gender-exploring youth. She does not agree with what she considers to be an overly lenient behavioral intervention for her aggressor. • In an effort to establish rapport, CL listens intently, substantiating SM's feelings, encouraging her detailed, and personal experience of the encounter. • During the interaction, SM suggests her disapproval of the youth's gender status, referring to him as "it," and hinting to his being "sick." • Unprompted, and in a seeming non-sequitur, SM reassures CL that "there was no blood exchange during the attack." She also brings up, indirectly and unbidden, her own past traumatic experiences, which seem to have contributed to her embittered state. SM eventually discloses her HIV-positive status. • The encounter leaves CL unsure about her role as a supervisor and as a clinician, even if she was "just moonlighting." • CL is uncertain about her reporting responsibilities after being told of SM's HIV-positive status.
II. Reflection (*on* action)	• Long after the index encounter took place, CL remains unsettled with her overall interaction with SM. The fact that SM seemed consoled and relieved after their interaction leaves CL feeling all the more confused: "Why am I feeling worse if she is feeling better?" • CL reflects back to her discomfort with how SM constantly referred to the youth as "it." • CL recognizes having struggled in the moment with balancing: (a) empathizing with SM; and (b) being true to her own civic duty to dismantle the observed prejudice that SM showed toward the youth. • CL felt "stumped" about her medico-legal responsibilities, if any, of reporting to hospital leadership about SM's HIV-positive status.
III. Script writing	• CL writes a first draft based on her recollection of the encounter, which incorporates the hybridized account of two previous clinical interactions. • That initial draft is shared with a standardized patient (SP) and a supervisor (S) familiar with the CCPS model. • Email exchanges with queries for clarification ensue. • Two weeks later, CL, SP, and S meet in person to further elaborate and clarify the script, as well as to role play the scenario. • During the role play, CL conducts the interview, and the script and the stage and acting directions are adjusted in order to maximize the emotional verisimilitude of the encounter.
IV. Simulated encounter with peer(s)	• Review of ground rules for the session and reading of door note (15 min). • Two peers (P_1 and P_2) take turns interviewing the SP-in-role (SP_{IR}). • Each peer conducts a 20 min portion of the interview. • Session flow is continuous, with no break between interviewers. • No time-outs or rewinds occur during the interview portion of the session. • There is a 5 min break built into the session before debriefing starts.
V. Simulated encounter with blinded supervisor	• Phase V is a variation of phase IV, its only difference being the participation of a supervisor blind to the case scenario (S_{BL}) as one of the interviewers on the "hot seat." • In our CCPS series, four sessions were conducted with peer interviewers only (IV), and two with an S_{BL} (V) serving as one of the interviewers. • For this particular session, only P_1 and P_2 served as interviewers (i.e., there was only a phase IV, but no phase V).

VI. Debriefing	• P_1 and P_2 begin by sharing their experience, including how they felt while being on the "hot seat" and under the watch of their peers and supervisor(s).
	• Other peers (P_3-P_n) and supervisor(s) share their observations and personal reflections.
	• The facilitating supervisor (S) aims to have most of the debriefing content come from P_1-P_n but provides input and guidance to steer the discussion, following best medical education practices in debriefing.
	• The scriptwriter (CL) shares only near the end of the debriefing and is encouraged to share just how realistic the scenario was, and what reflections were elicited in seeing a peer (or a supervisor) deal with the "same" patient in the simulated scenario.
	• SP, silent up to this point, is introduced in her re-rolled self, and goes on to share her experience and reflections while being in the role of SM.
	• For this particular scenario, some of the salient themes included:
	  ○ Challenges to establish empathy and ascertain trustworthiness with an off-putting, help-rejecting, and angry SM.
	  ○ Balancing attentive listening and asking of salient questions with a hyperverbal, demanding, and irritable SM.
	  ○ Welcoming/being aware of SM's emotional reaction regarding her aggressor, while also being aware of, and not allowing one's own countertransference to take over.
	  ○ Establishing effective communication dynamics and build rapport despite one's own charged response and anger to SM.
	  ○ Serving in multiple roles at once, including as a supervisor trying to resolve conflict between SM, other unit staff, and youth patient.

(Continued)

TABLE 2 | Continued

Phase	Applied case example
	◦ Communicating confidently and accurately regarding SM's HIV-positive status vis-a-vis the hospital's administration. ◦ CL acknowledges uncertainly about her medico-legal reporting responsibilities, if any, after being informed that the staff member has HIV. She learns in the debriefing that her colleagues were similarly unsure. ◦ Articulating where such information could be obtained (e.g., through a confidential inquiry to the legal or human resources office) and feeling comfortable with not having all answers readily on hand (e.g., "I don't know what may be my responsibility here, but I will inquire and consider possible next steps, if any.") ◦ Performing a risk assessment to ensure SM's wellbeing. ◦ Validating the emotions and mental/physical state of SM, while also acknowledging the emotions and mental state of the youth. ◦ Being flexible with adjusting previous behavioral intervention plans for a youth, after listening to SM's account. ◦ Reassuring SM that her communication with the clinician is confidential and will not affect her job status.

The source of the intensity could be free-floating and hard to pin down to a precise source, although at times there were clearly recognized triggers:

> I really struggled with what my own feelings were about, but when she called the patient "it," I had really strong feelings. I had no idea how to... When that went down, and it's all happening I just was not...on a human empathy level, I was not connecting with her. Because of this, it was hard to sit through. Being genuine with myself I just didn't know how much longer I could go listening to her (II.1).

The emotional charge in the room was strong enough to overflow from the interviewer-patient pair to those witnessing the interaction from the sidelines. As one of the witnessing peers recounted during the debriefing:

> You guys saw me with my hair down. It was just too much emotional input. I had to kind of go down and try to limit my vision and other sensory input to just calm down because it was all so difficult to hear. It was just so hard to sort out the systems part from the patient part because my emotional response was so overwhelming (II.5).

Efforts to defuse or de-escalate a patient's raw emotion were variably successful, with interviewers recognizing that certain ministrations may have been directed to themselves in a failed effort to gain control:

> I used the words, "That was really frustrating" a couple of times. I should have waited until I got more. "Frustrating" is a word we love because it makes us feel less uncomfortable. We're afraid of patients being furious. It's what you say to a toddler who is rageful, "Oh, are you frustrated?" That's what they teach you. "Are you afraid?" "No, mom: I want to murder you. I hate you mommy, I hate you." (II.2)

Sitting with the SP in quiet presence, listening attentively, and allowing silence into the interaction was often more effective. The newfound awareness to resist the urge to provide stock commands and empathic responses to the patient when under pressure was also revelatory. Here, silence could be construed as an active and intentional invitation, rather than the mere absence of speech:

> To hear before rushing in to validate: that part does not come so naturally to me. I have to remind myself—"Don't just *do* something: *sit* there" (IV.2).

> She opened up the most when you remained quiet. You gave her a big chunk of space, when it was all quiet. And that's when she started opening up about her HIV status. Because emotions can rise so high, we sometimes want to stop them, or to stop her, and to try to interject with "I hear you," or "just sit down," or to say anything at all. And sometimes the best thing is to just stay put and do nothing. It sure seemed to take effort (II.3).

> No matter what type of words we use for empathy, to see her [fellow peer's] body language as an interviewer, and to sense her presence itself, was much more powerful than the use of any words. Seeing her do it, seeing her just being present and actively listening was remarkable (IV.4).

Simulated patients responded to such a "less is more" approach:

> As a clinician, you were disarming to me as a parent. I wanted to be angry. In my script, I was ready to yell and scream, to swear. But you seemed to be really listening to me, and to care, so I could not muster any of that. It would not have come out as legitimate; it would have been a cartoon (IV.2SP).

2. Relate: *it is difficult to be angry at someone who treats you with respect*

It was only once the affective charge in the consultation room was dialed down that the interviewer could engage the patient's plight with an attitude of compassionate curiosity. Depending on personal style, areas of affinity or commonality, or on a pre-existing clinical relationship, clinicians were able to express empathy, humility, humor, vulnerability, or understanding, all in the service of connecting in such a way that could be received and returned in kind.

> I couldn't imagine the guilt, the shame or the things that she must've been holding and feeling, and the way she must have run

> to the bathroom to check and make sure there was no blood to see, "Okay, did I transfer it [HIV] to him?" And that should not be something that she should carry alone. But that's what she has been talking about, not having support from the workplace (II.7).

The unique circumstances of the COVID-19 pandemic organically led to finding common ground:

> As a therapist, all of a sudden you are on the same pandemic boat in that they are also locked in and sheltered in place. And so we are all undergoing a common stressor, and that is unusual in our work as therapists (IV.2).

Although certainly unusual outside of a shared disaster situation, the prolonged uncertainty of the pandemic crisis facilitated a leveling of the emotional playing field that can undergird meaningful human connection.

> To feel the commonality, rather than just talk about how that is impacting them and not considering your own experience. This is really hard but necessary: we're all going through a lot of stress (IV.3).

3. Reason: *keep it frontal*

Each of the six case scenarios was yoked to clinical tasks to be completed by the interviewers/fellow learners that the writers/clinicians felt they hadn't been able to complete when they had faced similar challenges in the past. For the educational purposes of this CCPS series, such task-based goals were of secondary, though not negligible importance.

The need to balance maintaining connection (which spans regulating and relating) with performing certain tasks or deliver specific content (reasoning) is not unique to the setting of an "artificial" simulation session. Indeed, it is inherent to all clinical practice, and as such, an important one to revisit and recalibrate periodically. One learner

> …worried about guns, now that you mention it. I considered asking, I wanted to push more. But at the same time, I see now that I was afraid to make him shut down. This was a hard situation. And I think that the shifting of gears from, "I'm in outpatient therapist/"empath" mode" to "I'm in emergency room/"do stuff" mode" proved to be a challenging switcheroo (I.8).

That interaction was experienced in a contrasting way by the de-rolled actor, as he described after the debriefing session:

> SP: The interviewers seemed so tentative and scared. And yet they weren't paralyzed. That is what blew my mind.
> S: Interesting choice of words, right?
> SP: They were so scared, yet no one asked if I had a weapon. Did they think that because it is an outpatient private practice setting no one could think of using a weapon? They just seemed so concerned about my coming back and my wife coming back. I felt like saying, "Hey my wife is going to come back as a widow."
> (I.8SP, I.9S)

As sessions progressed, clinicians were better able to navigate these competing needs, and to more seamlessly progress across the first three steps. Greater familiarity with the CCPS model was certainly one reason. Another was the collective ability to become more relaxed while "performing"—not just in front of each other, but in softening the edges of their idealized clinical selves, which loomed large as their graduation date fast approached.

> I realize now that I had been so focused on connecting with her. Clearly at the expense of carrying the ball forward. For a moment there in the middle I did carry it forward a bit, before getting stuck again (V.9).

As learners eased into the exercise, they gained intentionality in their actions, a future-forward reflexivity akin to scenic intelligence:

> It was like working along two axes at once. There was the "connecting" axis, you know, how much or how little, minute by minute, or during an hour, how much you are connecting at a human level. And a whole other axis of "getting business done." They both needed care and feeding (V.3S).

> Whether we ultimately got the answers "right" or "wrong," no one will really care. That part is less relevant, more forgettable, and more traditionally "teachable." It's less about that, and more about how this experience will inform us in the future. And I for one know that I've learned a lot just by being at these sessions (VI.1).

B. Reflection *on* action: the world as interpreted ('having done')

4. Reflect: *pressure—how diamonds are made*

Reflection is the central node of the 9R model, and one that is iteratively deepened throughout the cycle. As such, it is not entirely possible to disentangle it from the other components or timescales. This is exemplified in the longer quote that follows (I.10S), in which the simulation session, for the supervisor-turned-scriptwriter, serves as a point of departure for a reckoning over past clinical years. It starts with a reflection in the present, as the encounter is witnessed in real time, followed by what blind spots it revealed as the memories intimately bound to the case were "brought back to life:"

> I was so intensely rooting for them in my mind. I wanted them to get it right. We all knew that this wasn't "for real," that this was not being scored or evaluated for any kind of high stakes evaluation. And yet, it was *personally* important for me that they succeed. So I was really taken aback and saddened when they didn't, because it felt, and this is may be the key point, it felt like it was *me* who was failing.

From that key moment of intersubjectivity, the scene hearkens back to the past and its interpretation; to what led to the initial writing of the script in an effort to recontextualize earlier failures, whether real or perceived:

> This is what made the connection become visceral, because it was only after the case was complete and after seeing them "fail" in this part of the exercise that I realized that on not one but on two occasions in my professional career I had failed exactly in

> the same way that they had. And this realization had been lying dormant and forgotten somewhere in the back of my mind. Until then. Until I saw them in action. This was maybe a good 20+ years ago and I hadn't thought of it until seeing them squirm. They squirmed in the very same way that I had squirmed so many years before.

Anticipation informs future action, as the experience is metabolized and put to use toward new clinical and teaching opportunities:

> I only touched on the surface when telling them that "I have been where you were today," but I didn't fully share, not really. Not just because time ran out, but because I wasn't really aware then of what had just happened. I am committed to doing better in the future. And I certainly hope that in sharing this now and in the future, I will be able to close the loop.

Soon after emerging from the discomfort of being on the "hot seat," an interviewer captured the reflective essence of the simulation:

> We are learning. These exchanges are our teacher. I am grateful. I am open. I am hopeful that talking about vulnerabilities and hardships can apply pressure for us to think deeper, to delve deeper. Pressure. That's how diamonds are made after all (II.8).

The active gerund "learning" and the emphasis on the collective in the interpretation of the recent events mark a shared and ongoing process. Equally, the invocation of the geologic timescale of a gemstone serves a reminder of the enduring struggles of professional development; one in which the heat and pressures of what was once left unsaid is precisely what makes the experience a precious resource for the group.

5. Realities: *viruses do not discriminate, but society does* (29)

Even prior to the pandemic, participants had already confronted painful realities not only through the development of their own scripts, but by witnessing their peers' and their own reactions. For example, debriefing sessions fostered discussion that moved away from merely acknowledging implicit bias and unconscious behavior to talking about overt and systemic racism in a direct way:

> Being a Black doctor, I've had a lot of interactions with staff members who weren't that familiar with me, who questioned who I am, what I am. So, it's just that act of *doctoring while Black*: how do I communicate without being demeaning? I knew being Black while doctoring was real, but I never expected mirrors of my skin to invite more scrutiny than my actual self. Realizing that my physiology beams during these instances due to fear of rejection, to a need to be right, a need to be trusted, a need to be a beacon to my people—the minority. I am praying that being a doctor is no longer a surprise (II.14).

The patient depictions and ensuing interactions were evocative enough to prove stressful and morally confronting in the moment. But the exercise and its debriefing also afforded participants enough psychological distance to permit self-examination in a nurturing setting with sufficient time and supportive guidance. This made it possible to confront and discuss painful realities in a less activated and more considered manner than under the automatic fight, flight, or freeze responses that are so often ignited at these moments.

> "You people." I think I wanted to hear, "you *doctor* people" from her. But then she mentioned the chip on her shoulder, so I thought maybe she meant "you *educated* people." But that was just my not wanting to hear it, my wishful thinking. It was "you *Black* people" who she meant needed to go somewhere else. We needed to go to a separate unit—to a "Black unit" (II.12).

One of the strengths of the CCPS model is its ability to adapt iteratively and in real time to daily clinical vicissitudes. This became palpable during this six-part series, bisected as it was by the onset of the COVID-19 pandemic. As a case in point, the fourth session was initially designed around actual events experienced by the scriptwriter, who had confronted a parent seeking legal redress after the clinical team failed to ensure the safety of her adolescent daughter Emma, resulting in a serious suicide attempt while hospitalized as an inpatient. A few days before the simulation took place, the setting was adapted to the new realities:

> Scenario takes place while you are moonlighting as the on-call psychiatrist at an inpatient adolescent unit. Your institution has adopted the CDC guidelines during the COVID-19 pandemic: practicing social distancing, minimizing clinical staff on the unit, and communicating with patients and families through virtual online and telepsychiatry systems. You are about to get a Zoom call from Emma's very upset mother (From door note, session IV).

In very short order, we had to not only move the site of delivery from a brick-and-mortar location to a virtual one, but to address the many challenges posed by the viral crisis. Events and guidelines early in the pandemic changed on a daily basis and informed the content of the session, by which time the popularized claim of the virus's origin had reactivated an array of racist and xenophobic tropes with profound implications for Asian–Americans. Critical discussions around xenophobia and racism, along with the pandemic's grave elucidation of pre-existing health inequities became not just inevitable, but of urgent necessity.

> Emma is a bi-racial and bi-cultural (Chinese–American) 14-year-old adolescent girl who presented with depression and a serious suicide attempt following a racial cyberattack by her classmates: they had circulated an offensive meme of a "Chinaman" eating soup overflowing with bats and pangolins, and said that Emma surely ate the same "Chinese porridge" at home. They called her a "mongrel" and said that she, her father, and "their like" were responsible for spreading the "dirty, nasty China virus" (From door note, session IV).

6. Restraints: *life happens*

Over the course of the series, a number of imperfections, factual errors, anachronisms, or verbal missteps inevitably took place. Rather than dismissing these instances as events that diminished the verisimilitude of the clinical scene, we saw

in them, instead, vital conduits toward growth and reflection. Disruptions in the conceptual "fourth wall" of the "stage" separating a session's "performers" from its "audience" members provided valuable opportunities, as when a participant's snoring wrenched everyone's attention away from the actor. Bashful and self-conscious as he recomposed himself, he later went on to share during the debriefing:

> I'm embarrassed and so sorry that I snored, but I got no sleep: my friend died last night (III.8).

That expression of candid vulnerability and grief resonated with the group and, in turn, gave one participant permission to name their own human fragility:

> You were an influence. I'm actually growing my beard because my mother died 3 weeks ago. In the Jewish tradition, we grow out our beard as a sign of mourning. So when you first came in and said, "Hey, you look great with a beard," I thought to myself "No I don't. That's not the point." I only mention this because you too had a loss yesterday. I had a loss recently. And as I was coming into today's session, I was thinking that I have been back to work, that life goes on. Life went on for you as well. As it did a few weeks back when one of you showed up the same day your baby had been taken to the emergency room just a few hours before. These things happen. Life happens. And how do we each compartmentalize, ignore, embrace, or move on? So I salute and thank you for snoring, as it actually reminded me that this is all real, and that half of life is just showing up. Sometimes you're exhausted, and tired, and things happen, as they have today. And yet, you are here, as you have been for your patients (III.4S).

The fourth wall could also be breached through the overwhelming emotional response to a patient interaction. At such times, affective overflow spilled over onto the group trying to contain and make sense of it. This resulted in the intersubjective blending over who exactly was taking care of whom, as exemplified by a supervisor's recollection:

> You were sitting next to me and I was actually worried that you were having something medical going on. I didn't want to break the spell and say, "Are you having chest pain?" But I was really worried and hearing about the role confusion in the case made it additionally palpable: just who exactly is taking care of whom? Am I taking care of you, or being present to see how your colleagues take care of the SP? I'm so glad you were not having a heart attack, by the way. When I asked, I was relieved when you said, "No. It was overwhelming. I just needed to put on my screen" (II.7S).

In short, we consider whatever degree of "disruption" caused by the actions and experiences on both sides of the "stage" as equally important to the overall efficacy of the simulation sessions.

7. Relationships*: moving from me to we*

As a dyadic interaction between a clinician and an SP, CCPS is designed to provide a controlled environment in which to closely experience and examine human relationships as they are shaped and pressured by the clinical encounter. With the additional participation of fellow peers and supervisors, CCPS provides a rich setting through which to delve into what happens not only in the experiential interaction itself, but in that interaction as witnessed and interpreted by others ["moving from me to we," in the words of a participant who may have been paraphrasing Mohammed Ali's *Me We* poem, or Dan Siegel's *Mwe* construct (30)]. We go on to describe some of the relationships that can be fruitfully explored in this simulation setting.

Peer-on-patient. Participants articulated and shared challenges in empathizing with patients:

> My initial reaction was "This jerk. She hates trans-kids and there was nothing this kid could have done to make her feel differently..." We know she's struggling with the fact that these kids exist, but her awful language was hard to take, like calling the kid "it." But then as both [interviewers] were expressing curiosity and not shaming her, it actually became clear that it wasn't really a trans issue. It was rather an "I'm overwhelmed, and this is a change that I'll eventually get, but it is just one too many things right now" (II.10).

The participant's overwhelmed response speaks to a broader challenge for the group in learning to manage competing roles and responsibilities that seem at odds with each other:

> It became really hard to figure out what our exact role was, to remember "OK, this is a staff member, and you have some responsibility to the staff member. But there's also the patient, and you have a responsibility to the patient as well" (II.7).

Peer-on-peer. One of the more frequent comment types, and one articulated after virtually every session, was that of gratitude at the opportunity to see each other "in action" and to witness each other's distinct therapeutic styles:

> I'm never in a room where I see my peers interviewing like this. It's rare that I see a full interview or session and just sit there and watch, being so present in the moment. I learned so much from every single session I attended (VI.5).

> What really stands out to me now was how incredible it was to have the opportunity to see my co-fellows in action. I think I learned as much from watching them do their thing. Comparing their styles after having gone myself; watching them struggle with some of the same issues and challenges. And seeing them approach things from similar and at the same time unique angles was really useful, really educational (VI.6).

Peer-on-supervisor. The opportunity to work alongside a senior colleague and navigate the very same clinical challenge in real time was educationally potent for many:

> It was so useful to see how a senior child and adolescent psychiatrist got the "job" done, and how much growth I can look forward to throughout my career. I also think the discussion made me realize that no matter what, we are going to be making mistakes after we get out of fellowship, and that there's always an ongoing need for training and continuous feedback. This felt like a supportive place to really talk about that (V.1).

> In addition to seeing our peers, it was also wonderful to have the opportunity to observe faculty. It would have been a big loss to go through training and not see the wealth of experience that our faculty members have interviewing and struggling with their own patients (V.3).

Supervisor-on-peer. In turn, supervisors found grounding and comfort in sharing their own limitations and being able to see themselves in their trainees:

> Although they may have "failed," they failed in the very same way and at the same professional career stage that I had. I am humbled by the experience and so grateful that neither my patients nor this simulated patient lost their lives. My hope is that, if nothing else, sharing my own failure, may soften the blow of their own. There is comfort in knowing we are all similarly flawed. More importantly, that we are all similarly educatable and remediable, despite how unforgiving we may be with ourselves (I.8S).

C. Reflection *for* action: the world as anticipated ("will be doing")

One of the more challenging aspects of the simulation sessions, and one that required active facilitation, was in helping participants move from only critiquing their own or each other's performance during the patient interaction toward a place of growth and trusting anticipation—to incorporate lessons from the current experience as a template for future action:

> The ability of being able to see what you're doing while you're doing it is hard. There was a lot of talk about "presence," as there should. But they needed our help in moving the session to talk about the future. Having gone through this hard experience together, how do they now think these experiences can inform their future practice? (IV.9S).

To that end, anticipatory reflection provided the two distinct sets of educational opportunities outlined next.

8. Repair: *Try again. Fail again. Fail better* (31)

Scriptwriters were in the unique vantage point of seeing how their colleagues or supervisors would deal with a situation that had previously challenged or outright stumped them. In this way, they were able to transform a series of difficult encounters passively experienced as failure into a single "do-over" opportunity in the service of a humbled excellence:

> We are still learning and growing. The very things that make us uncomfortable now provide seeds for growth in the future. How do we choose to water them? As psychiatrists we hone into the role of problem-solver, healer, know-it-all. But what if we don't know? Is it OK to say we don't know? Will our patients forgive us? Will we forgive ourselves? (II.7).

As trainees fast approached their graduation and launch into independent practice after years of fellowship training, the yearning for competence had a particularly strong resonance, one that partly explained how

> . . .the challenge and even discomfort of the experience was how it rubs against the idealized notion of who you are and who you want to be moving forward (VI.2S).

For peers who in turn struggled while on the "hot seat" the obstacle became their path,

> . . .the take-home message was not that I "failed," which I didn't, because that wasn't the point here. We each "passed" by feeling the despair, the difficulty, and how to mobilize and re-mobilize when something inside us gets in the way. I think that is where we were all at. And I see that as a big success. I know I will apply these lessons as I move forward in my practice. And to see just what an "unleashed" simulated patient can do: that part was truly remarkable (VI.3).

There were further opportunities for reflection even after the simulation and debriefing sessions were over. The enduring "afterlife" of some sessions along with the trust that had developed was exemplified in a moment of repair that followed a misnaming incident:

> As people were leaving the room, I looked the way of one of my colleagues and mistakenly called her by the wrong name. My two colleagues are as different as two people can be. But they are both Black and have distinctly African names. I've never considered myself beyond reproach and am aware that we all have biases at play. But it was quite remarkable to see this take hold immediately after and in the context of our discussion on racism and bias. To be schooled so on the spot was to be served a big slice of humble pie. As if all of that wasn't enough, I checked my phone once during the break, wanting to make sure I hadn't missed anything clinically important over the past hour. And as I checked, I saw a news alert. The Administration had just extended a ban on immigrants from several African nations. I was embarrassed. Of my country. Of myself. I recognized this exercise had not been hypothetical. It was as real as real gets. I was humbled and schooled. I have so much to learn. We all do. By sharing it now I not only apologize (which I do once again here, in a heartfelt way), but see how much growth we each have ahead of us, and what a privilege it is to learn along as caring colleagues as she—and as magnanimous in her forgiveness (IV.6S).

In the session that followed, the same two individuals had to collaborate alongside each other on the "hot seat." Having an opportunity to extend these sentiments outside of the session and formally apologize was a powerful demonstration of the protean humility and action that the model can foster:

> Thank you very much for your email. It has made my day. I was almost going to make a comment then and there, but I decided it was not going to be helpful at the time, and that I could also reflect on the things elicited by being called a different name in that moment. For you to write about this and to share this openly takes an admirable level of courage and I'm inspired by it. Thank you (IV.7).

9. Reaffirm: *becoming child psychiatrists, together*

Each simulation session offered an opportunity for putting into practice an existing and hard-earned professional skillset. But

well beyond that, each session also offered the reaffirmation of mastery developed over the course of the six-part series, as

> …a safe place to revisit outdated clinical practices. When will we have time to really sit down together and process these challenging cases, not only to talk about them, but to see them unfolding in real time? I think that part was really valuable—the doing and not just the talking (VI.2).

A shared sense of recommitment became evident on at least three different planes:

As participants. Clinicians didn't only struggle; they also prevailed when facing the very challenges they had trained to resolve:

> The stress I felt was not because I thought, "Oh my God, I'm being watched," but rather because this was hard, truly hard. The patient interaction, I mean. And coming out "whole" on the other side, realizing I had done the very things I have spent so long training for—that gave me a very special and reassuring feeling (IV.3).

As supervisors. The demonstration of clinical competence by senior colleagues may have initially felt boastful, as when a supervisor shared ambivalence over

> …how "well" it went for me. I don't know what, if any, my "Open Sesame" was, but even as it was happening, and even as I sensed "I've got this," that was not what I wanted to model. I didn't want to give the illusion that I have some kind of magic. And I certainly didn't want for it to be all seamless and showy while you squirmed and struggled: I would have liked for us to share in a similar failure, to realize that we all can fail at times—as we surely do (3.8S).

By the end of the series, learners had expressed the value they found in seeing difficult situations handled by a supervisor, who in turn felt less compelled to apologize:

> That time, when I had been all guilt-ridden about not having failed and, you know, wanting to fail right there along with you. I found it liberating when you said, "Oh, it's actually very helpful to see you doing it so well, because otherwise you're like way more senior, and if you don't do a better job than me, then we're all screwed because we cannot ever learn and grow." I found that liberating: thank you (6.8S).

As a community. Ultimately, the series provided a shared experience for growth—not just of individuals developing and maturing as professionals, but of a group larger than its constituent parts, for

> In almost every session we talked not only about this or that person's performance: we were becoming child psychiatrists, together (6.2S).

DISCUSSION

We were able to apply the co-constructive patient simulation approach to a psychiatric clinical context. Moreover, we arrived at a structured nine-part model for reflective practice that offers a novel way to learn, teach, and experience psychiatry. To situate this model further, we first turn to examine the role of CCPS as a means of teaching and learning psychiatry, and the distinct ways the model garners its pedagogical utility for fostering compassionate curiosity in the group. We next consider CCPS's role as a means to build and strengthen a social community of learners. Lastly, we address the model's limitations and future opportunities.

Learning Psychiatry

In considering the potentially unique contributions and added value of CCPS, and particularly when contrasting it to traditional supervision, we apply the five "good teaching" perspectives proposed by Pratt et al. (32) as a conceptual frame through which to revisit the assumptions and beliefs that as medical educators we hold regarding learning, knowledge, and teaching. The first three of these perspectives are effectively incorporated by supervision and CCPS alike: *transmission*, or the transfer of knowledge in a way that goes beyond the mere mastery of techniques; *developmental*, or the constructivist attunement to the individual learner's unique needs and point of view; and *nurturing*, which recognizes the interaction between knowing and feeling in the learner, and that addresses vulnerabilities inherent to training, such as the fear of failure. The fourth perspective, *social reform*, refers to the fostering of ideals and values, particularly as they pertain to inequities in care. CCPS provided a setting to center issues such as racism, xenophobia, and transphobia to become readily palpable and contributed to the mobilization of its learners to address these issues in a more systematic way in their training and practice (33).

CCPS can be conceptualized as a variation of, and a synergistic complement to traditional supervision, which constitutes one of the educational bedrocks for teaching and learning psychiatry. Clinical supervision of trainees is associated with improved patient- and education-related outcomes. In turn, inadequate supervision has been repeatedly identified as one of the most common causes of medical errors. Since the early 1990s, medical specialties have required the physical presence of an attending physician during the delivery of key aspects of care by a trainee (34).

CCPS and the 9R model could provide a rubric to support the academic and professional development of individual trainees and their personal milestones, even if that was not the primary goal of this study. We believe that CCPS could stand to make a unique contribution to psychiatric education as the field moves into competency-based education (CBD) (35). CBD requires maturation beyond the current focus on education as a pass/fail model toward a developmental paradigm unique to each learner. It requires medical education to revisit its focus on the stigma of failure during the training years, and aims to create opportunities for trainees, graduates, and lifelong learners to "try again, fail again, and fail better," as Samuel Becket would

put it (31). For our field to simply adapt traditional psychiatric education methods could be a missed opportunity, as the major curriculum renewal embodied in CBD should not be a once-in-a-lifetime opportunity.

In the case of psychiatry, the "how" of supervision, largely unchanged for several decades, has been based on the teaching triad of modeling, rehearsal, and feedback (36). Supervision's "where" and "when" have been more variable, leading to four main types: (37) *case discussion*, in which the supervisor is removed in both place and time from the clinical action, and as such not privy to what actually takes place in a given interaction; *co-therapy,* in which supervisor and trainee join together in a session, to the detriment of the latter's independent action; *with delayed feedback*, in which the supervisor can, through a one-way mirror or recording technology, get a more objective sense of what took place and provide feedback at a later time; and *live*, in which the supervisor can provide input from a distance but in real time, as through a "bug" in the trainee's ear. Each of these four types can be complemented by the presence of fellow learners or supervisors, leading to *peer* or *group* variations of supervision. CCPS is in fact one type of group supervision, and one that through the sharing of space, time, and clinical interactions, results in the immediacy of reflection *in* action, *on* action, and in the mobilizing *for* action.

The "what" that is embedded in supervision can include a wide range of content. In the case of psychotherapy, for example, psychodynamic approaches have been common, if highly variable; cognitive-behavioral therapy training in psychiatry has advanced significantly over the past two decades; and even though supportive and eclectic psychotherapy is the most widely practiced, it still tends to receive the least systematic attention (38). Over the past decade, mentalization-based therapy has become increasingly popular in practice and training. Conceptually related to empathy, mentalization (or reflective functioning) is defined as "the capacity to understand and interpret—implicitly and explicitly—one's own and others' behavior as an expression of mental states such as feelings, thoughts, fantasies, beliefs and desires" (39, 40).

Through its close attention to the mental states of others (including of the professional actors in and out of their assigned SP roles), CCPS is particularly well positioned to incorporate a mentalization-based approach. The 9R model in turn provides a systematic and orderly roadmap through which to disentangle the components that inform overarching constructs as complex as mentalization. For instance, the sequence through which each participant shares their experience reveals the complex ways an event is mentalized as it reverberates within a group: from the scriptwriter who held the encounter with the original patient, through the interviewers' and actor's experience of the case, to its reception by the wider group of peers. Through the careful delineation of each perspective, participants describe the varied angles of arrival to the event so as to open clinical possibilities and bring curiosity to each other and to the clinical challenge. In one case in particular, debriefing the SP's use of transphobic language created a generative divide in the group where for one side, the language foreclosed any attempt to mentalize the patient's experience, whereas for the other side it was the SP's confusion over the appropriate language that catalyzed their mentalization. By being candid and vulnerable in giving voice to both sides while naming each constraint, CCPS grounds the theory of mentalization, and prepares trainees for the daily reality of the ways in which challenging cases often force the clinician to confront the gap between their idealized and empathic clinical self and the self that acted the best they could at the time and under pressure.

Becoming Psychiatrists

Pratt's fifth perspective, *apprenticeship*, may evoke an over-simplified "see one, do one, teach one" prescription for acquiring skills through a relationship between apprentice and mentor (41). More fitting is the notion that teaching and learning are "rooted in the doing of work, not just [the] talking about it" (32). Psychiatric encounters are often fraught with ambiguity and uncertainty, which can benefit from the type of experiential and situated learning that patient simulation makes possible (42). We consider that CCPS provides an opportunity for such apprenticeship in a way that traditional supervision cannot. It does so through practicing the belief that teaching and learning are best done while interacting and participating in shared work; by providing a context in which knowledge is tested, questioned, and applied; and by sharing in the responsibility of creating authentic and relevant tasks, problems, and assignments in which to put one's craft, knowledge, or skills into action.

By virtue of being a group-based experience in which trainees and supervisors see each other in action—and hear each other in reflection—CCPS relies on all participants involved, and not only on those in the more active roles of clinician, interviewer, or SP. Except for the actors, who joined only one session each, participants were involved in the complete series of six simulations. This thread of continuity afforded the group an opportunity to develop a commonality of experience, for trainees and supervisors to collaborate alongside each other on the humbling task of learning and growing together, to engage in thoughtful critique of the model, and to co-create a more nuanced, shared language and approach. In this way, the "dosing" effect of a series of simulations (as opposed to a single session) needs to be taken into account: the effects over time may be more than simply additive. For example, the broad range of challenges faced, coupled with the emotional responses and individual clinical approaches used to address them, gained momentum over time and had a virtuous learning impact on all learners.

By providing shared understanding and practice, by creating a bond among the learners and supervisors, and by explicitly addressing role modeling (43, 44), mentorship, reflection, narrative humility (45), and experiential learning, a beneficial "side effect" of the CCPS serial approach was in supporting the development of a community of practice (CoP) (46). Like other successful CoPs, CCPS is a collaborative effort that seeks the co-creation of practical solutions to common problems encountered in clinical practice (47). Participants were actively developing a CoP: becoming psychiatrists, together. CCPS was opportune and timely to the professional stage of the soon-to-graduate trainees in our series, who were transitioning

> "…from working as skilled practitioners to teaching about skilled practice. Their experience and expertise must be rendered in forms that are accessible and meaningful to novices. What they used to do without thinking they must now do with thought to how it is understood by those watching and/or participating. As they work, they must translate that work into steps and language that help learners understand not only the skill of doing but also the inner workings of "what is going on here"" (32).

Though not explicitly construed as a seminar on leadership skills, CCPS did link to the psychology of leadership and to "well-held vulnerability" (48) as one of its integral components. Such an entreaty toward candid and shared vulnerability as a source of strength, rather than weakness, is not new. In his classic sociological text *Becoming Psychiatrists: The Professional Transformation of Self*, Donald Light had already noted how

> "…more accurate than active-passive is the distinction between inner- and outer-directed; for the issue is not energy but susceptibility. All socialization requires active, emotional involvement; even when modeled, one is engaged. The passive person would be indifferent, apathetic" (49).

Even as we would be hard pressed to find an indifferent or apathetic participant to our CCPS series, and by that metric alone consider it to have been educationally effective, we go on to note the model's shortcomings.

Limitations and Future Opportunities

CCPS is a logistics-intensive undertaking, as it requires, at a minimum, the availability of: (1) professional actors with experience in medical simulation; (2) funding, with costs that are not prohibitive yet important to take into consideration (we compensated actors at the institutional rate, with a minimum engagement of 4 h per session); (3) space, to which we had ready access, but which may not be a given at other sites; and (4) release time from clinical responsibilities for all trainees and faculty involved.

One way to approach the cost and logistic complexity of CCPS is through the creation of enduring materials such as videotaped interactions that can then be used as stimuli for discussion or as teaching materials. We have started to explore this approach by turning one of our CCPS sessions (VI, "sexual health discussions") into an educational module we were able to deploy across a national network of CAP training programs (10). In this way, we have been able to consolidate and share training materials and standardized best practices across a larger number of sites and participants. Although this asynchronous (videotaped) approach does not address the same educational goals, we see it as a fruitful complement and natural byproduct of the synchronous CCPS model. The pandemic and the ensuing move to videoconferencing certainly contributed to this embrace of new technologies in education.

Our goal in this report was to explore the feasibility of applying the CCPS approach to psychiatry. This resulted in a 9R model of reflective practice that could in turn provide a useful rubric to support the academic and professional development of individual trainees and their personal milestones. Such a personalized approach was not our aim in this report but could be a fruitful next area of applied inquiry, both for shorter- (in-training) or longer-term (in-practice) educational outcomes.

We recognize that six of our seven simulations involved only one actor. Since clinical situations often involve several interacting individuals, we plan to explore these added layers of complexity in future adaptations of the model. None of our seven SPs was underage, a notable limitation when considering that our primary focus is on child and adolescent psychiatry. Even as children can be played by young adult actors, we are exploring ways of incorporating child actors into future scenarios (50). We are also interested in exploring the replication of a same case with an entirely new cast of participants, and to do so in a way that honors the "freshness" of each unique scenario.

Paradoxically, an approach that fosters spontaneity and rapid adaptation cannot be planned in as spontaneous and rapid a fashion. Indeed, advanced planning is inherently necessary to its process in order to recruit actors, to write scripts, and to get the activity ready for its learners. Despite these taxing requirements, we consider the potential to adapt CCPS to the specific local, linguistic, and cultural needs of its participants as one of its greatest potentials. For example, CCPS could be conducted in another language and, based on scripts developed on site, reflect the unique realities and idiosyncrasies of a given community and cultural context, applications of the approach that we intend to explore in the future.

CONCLUSION

In summary, co-constructive patient simulation is an experiential approach that fosters autonomous, meaningful, and individually tailored learning opportunities. CCPS and the 9R model of reflective practice can be effectively applied to psychiatry and have the potential to contribute uniquely to the educational needs of its trainees and practitioners. By preparing them to "fail better," CCPS seeks to humanize its participants in a generative way that not only celebrates and reaffirms their successes, but that fully embraces their imperfections and their unique feelings and fallibilities.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

This study involved human participants and was reviewed and approved by the Yale Human Investigations Committee (Protocol #2000026241). Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

AM and MC-F developed the CCPS model, they collaborated with IW, DA, and AA in scriptwriting and session preparation. AM, IW, DA, and MC-F designed the study and participated

in its sessions. AM and IW took the lead in analyzing the data and drafted the first version of the manuscript. AM is responsible for the integrity of the data and analyses. All authors reviewed and contributed to working drafts and approved the final submitted version.

FUNDING

This study was supported by the Riva Ariella Ritvo Endowment at the Yale School of Medicine, and by NIMH R25 MH077823, Research Education for Future Physician-Scientists in Child Psychiatry.

ACKNOWLEDGMENTS

We are grateful for the contributions of the professional actors, the logistic support of Barbara Hildebrand of the Yale School of Medicine's Teaching and Learning Center, and the learners' engaged participation.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2020.616239/full#supplementary-material

REFERENCES

1. Kubie L. The retreat from patients: an unanticipated penalty of the full-time system. *Arch Gen Psychiatry.* (1971) 24:98–106. doi: 10.1001/archpsyc.1971.01750080002002
2. Romanowicz M, Rosenbaum S, Feinstein C. The many facets of alliance: the Y-model, applied to child, adolescent and young adult psychopharmacotherapy. In: *Thinking About Prescribing: The Psychology of Psychopharmacology with Diverse Youth and Families*. Washington, DC: American Psychiatric Association Publishing; in press.
3. Attoe C, Kowalski C, Fernando A, Cross S. Integrating mental health simulation into routine health-care education. *Lancet Psychiatry*. (2016) 3:702–3. doi: 10.1016/S2215-0366(16)30100-6
4. Barrows HS, Abrahamson S. The programmed patient: a technique for appraising student performance in clinical neurology. *J Med Educ.* (1964) 39:802–5.
5. Harden RM, Gleeson FA. Assessment of clinical competence using an objective structured clinical examination (OSCE). *Med Educ.* (1979) 13:41–54. doi: 10.1111/j.1365-2923.1979.tb00918.x
6. Hodges B, Hanson M, McNaughton N, Regehr G. Creating, monitoring, and improving a psychiatry OSCE: a guide for faculty. *Acad Psychiatry.* (2002) 26:134–61. doi: 10.1176/appi.ap.26.3.134
7. Hodges BD, Hollenberg E, Mcnaughton N, Hanson MD, Regehr G. The psychiatry OSCE: a 20-year retrospective. *Acad Psychiatry.* (2014) 38:26–34. doi: 10.1007/s40596-013-0012-8
8. Ten Cate O. Nuts and bolts of Entrustable Professional Activities (EPAs). *J Grad Med Educ.* (2013) 5:157–8. doi: 10.4300/JGME-D-12-00380.1
9. Fallucco EM, Hanson MD, Glowinski AL. Teaching pediatric residents to assess adolescent suicide risk with a standardized patient module. *Pediatrics.* (2010) 125:953–9. doi: 10.1542/peds.2009-2135
10. Drozdowicz L, Gordon E, Shapiro D, Jacobson S, Zalpuri I, Stewart C, et al. Sexual health in child and adolescent psychiatry: multi-site implementation through synchronized videoconferencing of an educational resource using standardized patients. *Front Psychiatry.* (2020) 11:384. doi: 10.1016/j.jaac.2020.08.384
11. Brenner AM. Uses and limitations of simulated patients in psychiatric education. *Acad Psychiatry.* (2009) 33:12–9. doi: 10.1176/appi.ap.33.2.112
12. Martin A, Weller I, Amsalem D, Duvivier R, Jaarsma D, de Carvalho-Filho MA. Co-constructive patient simulation: a learner-centered method to enhance communication and reflection skills. *Simul Healthc.* (2020). doi: 10.1097/SIH.0000000000000528
13. Abdool PS, Nirula L, Bonato S, Rajji TK, Silver IL. Simulation in undergraduate psychiatry: exploring the depth of learner engagement. *Acad Psychiatry.* (2017) 41:251–61. doi: 10.1007/s40596-016-0633-9
14. McLeod SA. *Kolb - Learning Styles*. Simply Psychology (2017). Available online at: www.simplypsychology.org/learning-k (accessed September 28, 2018).
15. Schön DA. *The Reflective Practitioner: How Professionals Think in Action*. New York, NY: Basic Books (1983).
16. Wenger E. Communities of practice and social learning systems. *Organization.* (2000) 7:225–46. doi: 10.1177/135050840072002
17. Wenger E, McDermott R, Snyder WM. *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Cambridge: Harvard Business Review Press (2012).
18. Schweller M, Ledubino A, Cecílio-Fernandes D, de Carvalho-Filho MA. Turning the simulation session upside down: the supervisor plays the resident. *Med Educ.* (2018) 52:1203–4. doi: 10.1111/medu.13722
19. Gwin T, Villanueva C, Wong J. Student developed and led simulation scenarios. *Nurs Educ Perspect.* (2017) 38:49–50. doi: 10.1097/01.NEP.0000000000000080
20. Lewis KL, Bohnert CA, Gammon WL, Hölzer H, Lyman L, Smith C, et al. The Association of Standardized Patient Educators (ASPE) Standards of Best Practice (SOBP). *Adv Simul.* (2017) 2:1–8. doi: 10.1186/s41077-017-0043-4
21. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* (2006) 3:77–101. doi: 10.1191/1478088706qp063oa
22. Kiger ME, Varpio L. Thematic analysis of qualitative data: AMEE Guide. *Med Teach.* (2020) 42:846–54. doi: 10.1080/0142159X.2020.1755030
23. Finlay L. Negotiating the swamp: the opportunity and challenge of reflexivity in research practice. *Qual Res.* (2002) 2:209–30. doi: 10.1177/146879410200200205
24. Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant.* (2018) 52:1893–907. doi: 10.1007/s11135-017-0574-8
25. Bergold J, Thomas S. Participatory research methods: a methodological approach in motion. *Hist Soc Res.* (2012) 37:191–222. doi: 10.17169/fqs-13.1.1801
26. Varpio L, Paradis E, Uijtdehaage S, Young M. The distinctions between theory, theoretical framework, and conceptual framework. *Acad Med.* (2020) 95:989–94. doi: 10.1097/ACM.0000000000003075
27. Gero JS, Kannengiesser U. The function-behaviour-structure ontology of design. In: Chakrabarti A, Blessing LTM, editors. *An Anthology of Theories and Models of Design: Philosophy, Approaches and Empirical Explorations*. London: Springer London (2014), p. 263–83.
28. Perry BD. Examining child maltreatment through a neurodevelopmental lens: clinical applications of the neurosequential model of therapeutics. *J Loss Trauma.* (2009) 14:240–55. doi: 10.1080/15325020903004350
29. Ishmael S-M. *Even What Was Beyond Us / Was Recast in Our Image.* Blog post. Available online at: https://themainevent.substack.com/p/even-what-was-beyond-us-was-recast (accessed May 3, 2020).
30. Siegel DJ. *Aware: The Science and Practice of Presence*. New York, NY: TarcherPerigee (2018).
31. Beckett S. *Worsrtward Ho*. New York, NY: Grove Press (1983).
32. Pratt DD, Arseneau R, Collins JB. Reconsidering "good teaching" across the continuum of medical education. *J Contin Educ Health Prof.* (2001) 21:70–81. doi: 10.1002/chp.1340210203
33. Corneau S, Stergiopoulos V. More than being against it: antI-racism and anti-oppression in mental health services. *Transcult Psychiatry.* (2012) 49:261–82. doi: 10.1177/1363461512441594
34. Farnan JM, Petty LA, Georgitis E, Martin S, Chiu E, Prochaska M, et al. A systematic review: the effect of clinical

supervision on patient and residency education outcomes. *Acad Med.* (2012) 87:428–42. doi: 10.1097/ACM.0b013e31824822cc
35. Guerrero APS, Beresin E V., Balon R, Brenner AM, Louie AK, Coverdale JH, et al. The competency movement in psychiatric education. *Acad Psychiatry.* (2017) 41:312–4. doi: 10.1007/s40596-017-0712-6
36. Weerasekera P. The state of psychotherapy supervision: recommendations for future training. *Int Rev Psychiatry.* (2013) 25:255–64. doi: 10.3109/09540261.2013.769431
37. DeRoma VM, Hickey DA, Stanek KM. Methods of supervision in marriage and family therapist training: a brief report. *N Am J Psychol.* (2007) 9:415–22.
38. Sudak MD, Goldberg DA. Trends in psychotherapy training: a national survey of psychiatry residency training. *Acad Psychiatry.* (2012) 36:369–73. doi: 10.1176/appi.ap.11030057
39. Fonagy P, Gergely G, Jurist E, Target M. *Affect Regulation, Mentalization, and the Development of the Self.* New York, NY: Other Press (2002).
40. Katznelson H. Reflective functioning: a review. *Clin Psychol Rev.* (2014) 34:107–17. doi: 10.1016/j.cpr.2013.12.003
41. Nirodi P, El-Sayeh H, Henfrey H. Applying the apprenticeship model to psychiatry: an evaluation. *Prog Neurol Psychiatry.* (2018) 22:25–9. doi: 10.1002/pnp.494
42. Crider MC, Mcniesh SG. Integrating a professional apprenticeship model with psychiatric clincial simulation. *J Psychosoc Nurs Ment Health Serv.* (2011) 49:42–9. doi: 10.3928/02793695-20110329-01
43. Kenny NP, Mann KV, MacLeod H. Role modeling in physicians' professional formation: reconsidering an essential but untapped educational strategy. *Acad Med.* (2003) 78:1203–10. doi: 10.1097/00001888-200312000-00002
44. Benbassat J. Role modeling in medical education: the importance of a reflective imitation. *Acad Med.* (2014) 89:550–4. doi: 10.1097/ACM.0000000000000189
45. DasGupta S. Narrative humility. *Lancet.* (2008) 371:980–1. doi: 10.1016/S0140-6736(08)60440-7
46. Cruess RL, Cruess SR, Steinert Y. Medicine as a community of practice: implications for medical education. *Acad Med.* (2018) 93:185–91. doi: 10.1097/ACM.0000000000001826
47. de Carvalho-Filho MA, Tio RA, Steinert Y. Twelve tips for implementing a community of practice for faculty development. *Med Teach.* (2018) 42:143–9. doi: 10.1080/0142159X.2018.1552782
48. Drago-Severson E, Blum-DeStefano J. From supervision to "super vision": a developmental approach to collaboration and capacity building. In: Zepeda S, Ponticell J, editors. *The Wiley Handbook of Supervision.* Hoboken, NJ: Wiley Blackwell (2018), p. 329–51.
49. Light D. *Becoming Psychiatrists: The Professional Transformation of Self.* Toronto: W.W. Norton (1980).
50. Budd N, Andersen P, Harrison P, Prowse N. Engaging children as simulated patients in healthcare education. *Simul Healthc.* (2020) 15:199–204. doi: 10.1097/SIH.0000000000000452

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

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 09 February 2021
doi: 10.3389/fpsyt.2021.632252

Controlled Study of the Impact of a Virtual Program to Reduce Stigma Among University Students Toward People With Mental Disorders

Matías E. Rodríguez-Rivas[1]*, *Adolfo J. Cangas*[2] and *Daniela Fuentes-Olavarría*[1]

[1] *Universidad del Desarrollo, Facultad de Medicina Clínica Alemana, Santiago, Chile,* [2] *Department of Psychology, University of Almería, Almería, Spain*

Stigma toward mental disorders is one of today's most pressing global issues. The Covid-19 pandemic has exacerbated the barriers to social inclusion faced by individuals with mental disorders. Concurrently, stigma reduction interventions, especially those aimed at university students, have been more difficult to implement given social distancing and campus closures. As a result, alternative delivery for programs contributing to stigma reduction is required, such as online implementation. This paper reports the results of a controlled study focused on an online multi-component program on reducing stigma toward mental illness that included project-based learning, clinical simulations with standardized patients and E-Contact with real patients. A total of 40 undergraduate students from the Universidad del Desarrollo in Santiago, Chile, participated in the study. They were randomly divided between an intervention and control group. The intervention group participated in the online multi-component program, while the control group participated in an online educational program on cardiovascular health. We assessed the impact of the program by using the validated Spanish-language versions of the Attribution Questionnaire AQ-27 and the Questionnaire on Student Attitudes toward Schizophrenia with both groups, before and after the intervention. In addition, an *ad hoc* Likert scale ranging from 0 to 5 was used with the intervention group in order to assess the learning strategies implemented. Following the intervention, the participants belonging to the intervention group displayed significantly lower levels of stereotypes, perception of dangerousness, and global score toward people with schizophrenia ($p < 0.001$). In addition, participants presented lower levels of dangerousness-fear, avoidance, coercion, lack of solidarity, and global score ($p < 0.001$). The control group displayed no statistically significant differences in the level of stigma before and after the evaluation, for all of the items assessed. Finally, the overall assessment of each of the components of the program was highly positive. In conclusion, the study shows that online programs can contribute to reducing stigma toward mental disorders. The program assessed in this study had a positive impact on all the dimensions of stigma and all of the components of the program itself were positively evaluated by the participants.

Keywords: stigma, undergraduate education, E-contact, standardized patient (SP), project based learning (PBL), multicomponent interventions, stigma reduction programme

OPEN ACCESS

Edited by:
Andres Martin,
Yale University, United States

Reviewed by:
Doron Amsalem,
Columbia University, United States
Stephanie Neary,
Yale University, United States

***Correspondence:**
Matías E. Rodríguez-Rivas
matrodriguezr@udd.cl

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *22 November 2020*
Accepted: *20 January 2021*
Published: *09 February 2021*

Citation:
Rodríguez-Rivas ME, Cangas AJ and Fuentes-Olavarría D (2021) Controlled Study of the Impact of a Virtual Program to Reduce Stigma Among University Students Toward People With Mental Disorders. Front. Psychiatry 12:632252. doi: 10.3389/fpsyt.2021.632252

INTRODUCTION

Stigma toward mental disorders is one of today's most pressing global issues. (1), with important implications such as high levels of social exclusion (2), poor quality of life (3), and low social support (4), for those affected by them. Furthermore, there are barriers to access and continuity of education and employment (5, 6), and higher risks of dying by suicide (6) among this specific population.

Mental health professionals and medical students have been found to stigmatize psychiatric patients (7, 8), and 40% of people with a mental disorder report unfair treatment by health professionals such as medical doctors, psychiatrists, psychologists, and nurses (9, 10). Experiencing stigma in medical settings is a stressor that contributes, among others, to reducing patients' quality of life and to exacerbating inequities in health outcomes and access to healthcare (11–13). Furthermore, stigma is considered a major obstacle against processes of mental health recovery (14–16) and is a main determinant of the quality of care delivered by health professionals and medical students (17, 18).

At the international level, several strategies have been implemented within the general population, as well as medical students, to reduce stigma toward mental disorders (19), and the most successful ones have been those involving direct contact with patients (20, 21) as well as programs with strong educational components (16, 22–24). It has been shown that direct, person-to-person contact and activities where the participants and patients share thoughts and experiences around mental health are key to the success of these programs (25–27).

While these strategies have been implemented in different countries (28–30) and have led to decreasing stigma (31, 32) and promoting positive perceptions of psychiatric patients among students and professionals (33, 34), their implementation in virtual learning spaces is recent, particularly for university students (35). Several authors highlight the advantages of using multimedia resources, for instance audiovisual educational resources with standardized patients (36, 37), E-contact with psychiatric patients (38), and even the implementation of educational videogames (39, 40).

In the context of the SARS-CoV−2 pandemic, lockdowns and physical distancing recommendations, stigmatization and instances of discrimination against individuals with mental disorders have increased and have negatively impacted their well-being and quality of life (41). Additionally, the implementation of measures aimed at reducing the transmission of the virus have hampered the implementation of on-site interventions focused on the reduction of stigma toward psychiatric patients (42), and in that context, developing and implementing innovative and online alternatives is paramount.

Among such alternatives, for university students, active and interdisciplinary project-based learning, where students lead and develop a final project, has been proven useful (43, 44), as it promotes critical thinking, practical application of knowledge (45), and problem-solving skills (46). Its implementation in the training of health professionals on mental disorders is recent, however it has proven to effectively foster professional skills (47) and a comprehensive and inclusive understanding of the different social processes involved in mental health outcomes and care (48–50). As it allows students to reflect on their knowledge to implement their skills in a creative way (51), it is considered an innovative educational tool for the reduction of stigma toward mental health disorders and psychiatric patients.

In addition to project-based learning, the use of standardized patients has shown different benefits for skill training and e-learning in the field of education in psychiatry and mental health (52). Including it as part of educational intervention strategies has had a positive impact (53), particularly on skill and knowledge development, and for the promotion of a holistic understanding of mental disorders (54). However, working online rather than on-site with standardized patients in order to reduce stigma toward mental disorders is a recent, underexplored development in the field, which requires complementary educational interventions (37), along with the creation of original scripts focused on the story around experiencing the illness and the recovery process (55, 56).

Finally, E-contact, defined as "computer-mediated real-time interactions where members of different groups interact online" (57), has been used as a strategy for raising awareness and reducing prejudice among ideologically different groups (58, 59). However, its implementation in the field of stigma-reduction is new and innovative, and the existing evidence shows that it can reduce stigma toward the transgender population (60). With regards to the use of E-contact to reduce stigma toward mental disorders, to date, only one experimental study has been conducted, and has demonstrated that E-contact reduces anxiety, rage and stereotypes toward individuals with schizophrenia (38). In that sense, this confirms the relevance of including E-contact in interventions aimed at reducing stigma toward people with mental disorders, for instance through the use of synchronous videoconferencing (61).

The objective of this study is to demonstrate the effectiveness of a multi-component online intervention incorporating E-contact with mental healthcare patients, standardized patients, and a project-based learning program.

MATERIALS AND METHODS

Participants

The participants were recruited within the Universidad del Desarrollo in Santiago, Chile, during "Innovation Week," an event organized by the university, where students belonging to the first 3 years of undergraduate studies in different disciplines work on different innovative responses to local social issues.

The sample consisted of 40 university students in their first, second or third year, 32 of which studied health science degrees and the remaining 8 studied social science degrees. Eighty percent of the participants were women and 20% were men, all aged between 18 and 23 years old ($X = 20.6$; $SD = 1.3$). None of the participants had been trained in psychiatry.

The intervention group and control group were each made of 20 randomly allocated participants, with equal proportion of men and women, area of study, and no statistically significant difference with regards to age ($p > 0.05$).

Instruments

Questionnaire on Student Attitudes Toward Schizophrenia (QSAS)

This instrument (62) aimed at evaluating the items of stereotyping toward schizophrenia and social distancing was developed for, and implemented with, high school students in Germany, during the World Program Against Stigma and Discrimination of the World Association of Psychiatry. The current study used the validated Spanish-language version developed by Navarro et al. (63), which possesses the appropriate psychometric properties, with a Cronbach's alpha of 0.95 for both evaluated factors.

Attribution Questionnaire (AQ−27)

This instrument (64) is used to quantify stigma toward people with mental disorders among the general population. It presents the participants with the case of a person diagnosed with schizophrenia and evaluates stereotyping and prejudice through a 9-point Likert scale. The current study used the Spanish-language, shorter version with 14 items, validated by Saavedra et al. (65), which possesses the appropriate psychometric properties for its four factors. (dangerousness-fear = 0.88, lack of solidarity = 0.837, coercion = 0.864, and avoidance = 0.758).

Learning Strategies Assessment Scale

This instrument was designed specifically for the current study. Participants assessed the integration of the different intervention strategies on a scale of 0 to 5, focusing on the perceived impact on empathy, understanding of recovery and social inclusion of people affected by severe mental disorders. In addition, the degree of recommendation of the program was assessed. The scale is available as **Supplementary Material**.

Procedure

Prior to their participation in either group, the participants gave their written informed consent in accordance with the Declaration of Helsinki (66) and the Singapore statement on research integrity (67). The study was approved by the Ethics Committee of Universidad del Desarrollo, Santiago, Chile (protocol number: 2020–142). Once the participants were randomly allocated to the intervention and control groups, they all completed the AQ−27 and QSAS questionnaires described previously. These questionnaires were sent to the participants 15 min before the beginning of the study and were completed online. The experiment began once the participants had completed both questionnaires.

With respect to the intervention, the intervention group participated in the multi-component online program, which lasted 14 h equally distributed across two days. The program consisted of the three consecutive interventions described below:

a. Two sessions including a simulation with standardized patients with emotional, substance use and anxiety disorders and an education workshop. These common mental disorders are psychiatric comorbidities and are highly prevalent among patients with schizophrenia (68, 69). An online presentation was carried out by two trained actors focused on the main characteristics of these disorders. Previous to the presentation, the research team had designed original scripts based on the recovery process of the patient and their family environment. During every simulation, dynamic interactions took place between the trained actors and the students, who asked them, for instance, about their life-experience, how they were feeling, etc. Additionally, an educational workshop was carried out for each simulation, in order to discuss the essential aspects of the mental disorders presented during the simulation. Each session lasted 2.5 h.
b. E-contact activity with an adult diagnosed with schizophrenia, who discussed and analyzed their recovery process with the students, including the role of the healthcare system, the community and their family. This activity lasted 3.5 h.
c. Project-Based Learning. During the two days of the program, activities aimed at developing an intervention around the reduction of stigma and the promotion of social inclusion for people with mental disorders, designed and led by the students were implemented. At the end of the second day, the students had the opportunity to present, in a webinar, the interventions they had developed throughout the course of the program, to the other participants and to the members of the evaluation jury, which included the patient with whom the E-contact activity was carried out. This allowed the participants to receive feedback from an individual who had experienced a severe mental disorder. The presentations were carried out in groups, and the interventions introduced were related to the promotion of social inclusion and the rights of people affected by mental disorders in the academic and local community, with emphasis on raising awareness around stigma and education on mental health. This activity had a duration of 5.5 h, distributed between the development of the initiative, tutoring from the teaching team and the final presentations. An example of one of the projects carried out by the students is available as **Supplementary Material**.

The control group participated in an online educational program on cardiovascular health of the same duration.

Finally, at the end of both days, each group answered the AQ-27 and QSAS questionnaires. Additionally, the intervention group completed the Learning Strategies Assessment Scale.

Figure 1 summarizes the whole procedure of the study.

Statistical Analysis

Student's *t*-test for independent samples was used to assess whether there were statistically significant differences between the pre- and post-intervention measures in both groups. Additionally, Cohen's d was used to determine the effect size of the intervention.

The pre- and post-measures of each group were subsequently analyzed with the use of Student's t for related samples, which was complemented with the measure of the effect size of the intervention through Cohen's d. Finally, descriptive statistics were used for the analysis of the global assessment of each one of the intervention strategies. We used SPSS 22.0 software to carry out the statistical analysis.

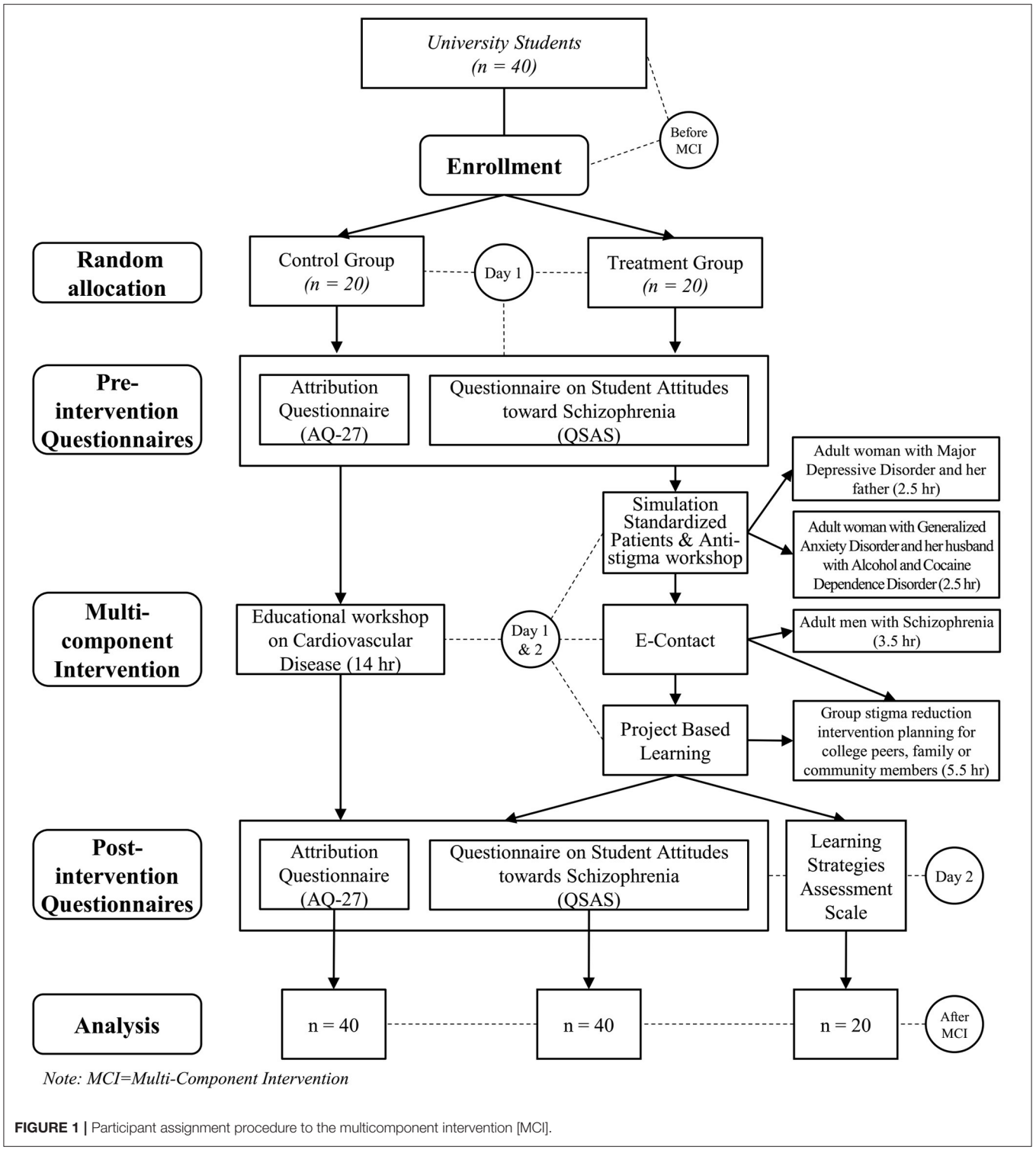

FIGURE 1 | Participant assignment procedure to the multicomponent intervention [MCI].

RESULTS

As **Table 1** shows, there is no statistical difference between the intervention and control groups prior to the intervention for any of the items of either instruments. However, statistically significant differences are observed for the group means in the post-intervention measures for both groups for all of the analyzed variables. Using Cohen's d effect size allowed us to determine a great effect size for all of the dimensions evaluated for both instruments, except for the

TABLE 1 | Student's *t*-test for independent samples of pre-test and post-test differences between the intervention group and control group.

	Pre-test			Post-test		
Variable	***t***	***p***	***d***	***t***	***p***	***d***
QSAS						
Dangerousness	0.48	0.63	0.16	4.88	0.000	1.45
Stereotypes	−0.45	0.65	−0.16	2.10	0.04	0.76
Total	0.09	0.92	0.03	4.24	0.000	1.40
AQ−27						
Dangerousness-Fear	0.27	0.78	0.08	9.76	0.000	2.27
Avoidance	−1.83	0.08	−0.47	6.29	0.000	1.81
Coercion	−0.69	0.49	−0.26	6.88	0.000	2.25
Lack of Solidarity	0.98	0.33	0.31	3.27	0.004	1.00
Total	−0.38	0.70	−0.11	11.61	0.000	2.64

QSAS, Questionnaire on Student Attitudes toward Schizophrenia, Adapted from Schulze et al. (62).
AQ−27 = Attribution Questionnaire, Adapted from Corrigan et al. (64).

stereotypes indicator, which displays a more conservative effect size.

Table 2 shows the average means and standard deviations for each variable for both instruments corresponding to the intervention and control groups for each phase of the study. The analysis of the post-intervention scores of the control group shows that there is no statistically significant difference for any of the variables studied in either instruments. However, statistically significant differences are observed in the same analysis of the scores for the intervention group, for all of the scores of the questionnaires in relation to stigma in every proportion. Regarding the effect size, the program had a positive impact on stigma reduction as reflected on each one of the analyzed items and the global score of both questionnaires.

The assessment given by the participants on the intervention was measured with a Likert scale ranging from 0 to 5 points. As **Table 3** shows, 95% ($n = 19$) of the students assessed at the top level the usefulness of the program in understanding the recovery process and promoting social inclusion of patients with severe mental disorder, while 100% ($n = 20$) of them rated at the top level the promotion of empathy. Additionally, 95% ($n = 19$) stated they would recommend this program to a peer. There was no statistically significant differences between the three interventions and their integration. Finally, positive and uniform comments were presented, also in conjunction with the following representative verbatim quotes: "The activities we carried out, helped me to have a better view of mental illness, and the use of simulated patients was useful in the experience and learning"; "I really liked the simulations and the E-Contact, it makes it much more didactic to learn and understand about mental illness" and "was a wonderful experience, it would be a huge challenge to do it on-site."

DISCUSSION

Stigma toward mental disorders is a pressing issue, considering, on the one hand, its impact on the wellbeing and quality of life of individuals with mental disorders (14–19), and on the other hand, that it is pervasive among the general population, health professionals and university students (7–10, 70–72).

At present, and to the best of our knowledge, there is no multi-component program focused on stigma toward mental disorders entirely carried out online. For this reason, as well as the lockdowns and social distancing measures implemented as a result of the SARS-CoV−2 pandemic, this study focuses on the implementation of an online program.

The results show that the intervention had a positive impact on the reduction of stigma among the intervention group. These results may be explained by the intensity of the program, the integration of multiple components, the focus given to the recovery process and the implementation of direct E-contact between mental health patients and students, all of which have been demonstrated to be key points for the implementation of a successful stigma-reduction program (54–58, 73–77). Additionally, further studies comparing the effectiveness of implementing the multicomponent program on-site rather than online, are necessary. Other studies have shown that comparable online interventions have an impact similar to those implemented on-site (27, 78).

Considering that the intervention was intensive, taking into account the number of activities carried out in a short amount of time, further qualitative studies will explore the experience of the participants and the lessons learned from the implementation of the key components, in order to adapt and adjust the program and make it easier to replicate.

It is important to emphasize that the assessment that the students made of the program was positive with respect to online implementation for each of its components, and the components focused on the promotion of empathy, social inclusion and understanding of the recovery process of severe mental disorders scored the highest, especially when integrated together. This suggests that the participants enjoyed the experience, would recommend it to peers, bringing evidence on the advantages of interventions that take into account the motivation of university students toward learning and goal-achievement, which is in turn one of the main challenges of digital education (79, 80).

TABLE 2 | Means and standard deviations of pre-test, post-test, and Student's *t*-test for related samples of post-test–pre-test differences in the study variables for the intervention group and control group.

	Intervention group							Control group						
	Pre-test		Post-test		Pre-post			Pre-test		Post-test		Pre-post		
Variable	***M***	***SD***	***M***	***SD***	***t***	***p***	***d***	***M***	***SD***	***M***	***SD***	***t***	***p***	***d***
QSAS														
Dangerousness	3.20	2.37	1.15	1.53	3.00	0.007	1.02	3.55	1.70	3.45	1.63	0.80	0.42	0.05
Stereotypes	3.05	1.50	1.90	1.25	2.52	0.02	0.83	2.8	1.47	2.95	1.46	−1.14	0.26	−0.10
Total	6.25	3.43	3.05	2.16	3.24	0.004	1.11	6.35	2.64	6.40	2.60	−0.43	0.66	−0.01
AQ−27														
Dangerousness-Fear	17.4	7.54	7.5	2.81	6.41	0.000	1.73	18.05	7.2	18.3	6.08	−0.56	0.58	−0.03
Avoidance	11.85	4.34	4.2	1.67	8.66	0.000	2.32	9.60	5.09	10.05	4.23	−1.33	0.19	−0.09
Coercion	10.9	4.62	4.65	1.87	7.70	0.000	1.77	9.85	3.16	10.20	2.93	−1.27	0.21	−0.11
Lack of Solidarity	7.05	3.10	5.00	1.52	3.66	0.002	0.83	8.15	3.88	7.7	3.46	2.01	0.05	0.12
Total	47.2	14.22	21.35	6.52	9.90	0.000	2.33	45.65	13.57	46.25	11.58	−0.88	0.38	−0.04

QSAS, Questionnaire on Student Attitudes toward Schizophrenia, Adapted from Schulze et al. (62).
AQ-27, Attribution Questionnaire, Adapted from Corrigan et al. (64).

TABLE 3 | Intervention group participants who rate the integration of learning strategies at the top level ($n = 20$).

	Integration of the 3 types of learning strategies	
Variable	***n***	**%**
Understanding of recovery of SMD	19	95
Promotion of empathy toward SMD	20	100
Promotion of social inclusion of SMD patients	19	95
Would recommend the program to a peer	19	95

SMD, Severe Mental Disorder.
Top level rate, Top score of Learning Strategies Assessment Scale (5 points).

In that sense, the educational intervention methods used in the current study are supported by robust theoretical and empirical evidence, and are especially adequate for online implementation, which is key in the context of the SARS-CoV-2 pandemic and the restriction of on-site interventions (36–40, 53–56). This also represents an opportunity for future integration of similar programs in university curricula, as they offer the possibility to reach remote areas, to establish contact between people with different experiences around mental disorders and between patient communities through E-contact and to generate student-led projects. Furthermore, the online modality of these programs promotes collaborative work between individuals and institutions across different countries, contributing, on the one hand, to foster cultural diversity, and on the other hand, to develop international education networks (81, 82).

In conclusion, the design and implementation of this type of interventions and educational spaces focused on diminishing stigma toward psychiatric patients contribute to normalizing these experiences among the population, by openly sharing challenges around mental health and promoting effective help-seeking and the delivery of adequate treatment to those who need it (83, 84). The study shows that online programs can promote new types of interventions aimed at reducing stigma not only in a context of mandatory social-distancing and lockdowns due to the SARS-CoV-2 pandemic, but also complementing existing on-site programs.

However, the study presents several limitations. First, the sample is relatively small, comes from one specific institution and is not representative of the general population, which may undermine the generalization of the results and limit the interpretation of the effect size. Second, the phases of the intervention were not experimentally evaluated in an independent way and the measure of stigma was only evaluated for schizophrenia, making it necessary to include other prevalent mental disorders in future research. Third, specific characteristics of the participants and possible confounding factors, which may influence the results, such as their socio-cultural background and their level of knowledge, desire to work in psychiatry and closeness to mental disorders were not evaluated. Finally, the long duration of the program may limit its replication, presenting several logistical challenges in its implementation through virtual platforms, specifically when considering factors such as student motivation and the exhaustion experienced in this regard.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. This data can be found here: https://data.mendeley.com/datasets/p5d39f3kp6/1.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of Universidad del Desarrollo, Santiago de Chile (protocol number: 2020–142). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MR-R, AJC, and DF-O contributed to the conception, coordination, and design of the work. MR-R and DF-O contributed to the implementation of the program. MR-R and AJC performed the statistical analysis. All authors contributed to the article and approved the submitted version.

FUNDING

This work was funded by the Spanish Ministry of Science, Innovation and Universities: (PSI2017-84961-R AEI/FEDER, UE), and by the National Agency for Research and Development (ANID)/Scholarship Program/MAGISTER NACIONAL/ 2020–22200859.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.632252/full#supplementary-material

REFERENCES

1. WHO-AIMS. *Evaluación del Sistema de Salud Mental de Chile: Segundo informe. Informe Anual Sobre Derechos Humanos En Chile 2014.* Ginebra: WHO (2014). Available online at: https://www.who.int/mental_health/who_aims_country_reports/who_aims_report_chile.pdf
2. Thornicroft G, Rose D, Kassam A, Sartorius N. Stigma: Ignorance, prejudice or discrimination? *Br J Psychiatry.* (2007) 190:192–3. doi: 10.1192/bjp.bp.106.025791
3. Corrigan PW, Shapiro JR. Measuring the impact of programs that challenge the public stigma of mental illness. *Clin Psychol Rev.* (2010) 30:907–22. doi: 10.1016/j.cpr.2010.06.004
4. Mascayano F, Lips W, Mena C, Manchego C. Estigma hacia los trastornos mentales: características e intervenciones. *Salud Ment.* (2015) 38:53–8. Available online at: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0185-33252015000100008&lng=es&tlng=es (accessed November 11, 2020).
5. López M. Work and employment for people with severe mental disorders. Some proposals based on the available information. *Revi Asoc Esp Neuropsiq.* (2004) 24:31–66. Available online at: http://dialnet.unirioja.es/servlet/articulo?codigo=864102&info=resumen&idioma=SP (accessed November 11, 2020)
6. Yang L, Valencia E, Alvarado R, Link B, Huynh N, Nguyen K, et al. A theoretical and empirical framework for constructing culture-specific stigma instruments for Chile. *Cad Saude Colet.* (2013) 21:71–9. doi: 10.1590/S1414-462X2013000100011
7. Vicente B, Saldivia S, Pihán R. Prevalencias y brechas hoy; salud mental mañana. *Acta Bioeth.* (2016) 22:51–61. Available online at: https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S1726-569X2016000100006 (accessed November 11, 2020)
8. Navarro N, Triguero R. Estigma en los profesionales de la Salud Mental: una revisión sistemática. *Psychol Soc Educ.* (2019) 11:253–66. doi: 10.25115/psye.v11i2.2268
9. Arens E, Berger C, Lincoln T. Stigmatization of patients with schizophrenia: the influence of university courses on the attitudes of prospective psychologists and doctors. *Nervenarzt.* (2009) 80:329–39. doi: 10.1007/s00115-008-2646-4
10. Funk M, Drew N, Knapp M. Mental health, poverty and development. *JPMH.* (2012) 11:166–85. doi: 10.1108/17465721211289356
11. Hernández de Cadena N, Escobar C. Una aproximación al maltrato a los pacientes con trastornos mentales. *MedUNAB.* (2004) 7:3. Available online at: http://revistas.unab.edu.co/index.php?journal=medunab&page=article&op=viewFile&path%5B%5D=231&path%5B%5D=214 (accessed November 11, 2020)
12. Khenti A, Bobbili S, Sapag J. Evaluation of a pilot intervention to reduce mental health and addiction stigma in primary care settings. *J Community Health.* (2019) 44:1204–13. doi: 10.1007/s10900-019-00706-w
13. Poreddi V, Thimmaiah R, BadaMath S. Medical and nursing students' attitudes toward mental illness: an Indian perspective. *Invest Educ Enferm.* (2017) 35:86–94. Available online at: https://doi.org/10.17533/udea.iee.v35n1a10 (accessed November 11, 2020)
14. Jadhav S, Littlewood R, Ryder A, Chakraborty A, Jain S, Barua M. Stigmatization of severe mental illness in India: against the simple industrialization hypothesis. *Indian J Psychiatry.* (2007) 43:189–94. doi: 10.4103/0019-5545.37320
15. Vidourek R, Burbage M. Positive mental health and mental health stigma: A qualitative study assessing student attitudes. *MHP.* (2019) 13:1–6. doi: 10.1016/j.mhp.2018.11.006
16. Yin H, Wardenaar K, Xu G, Tian H, Schoevers R. Mental health stigma and mental health knowledge in Chinese population: a cross-sectional study. *BMC Psychiatry.* (2020) 20:323. doi: 10.1186/s12888-020-02705-x
17. Lien Y, Lin H, Tsai C, Lien Y, Wu T. Changes in attitudes toward mental illness in healthcare professionals and students. *Int J Environ Res Public Health.* (2019) 16:4655. doi: 10.3390/ijerph16234655
18. Schulze B. Stigma and mental health professionals: a review of the evidence on an intricate relationship. *Int Rev Psychiatry.* (2007) 19:137–55. doi: 10.1080/09540260701278929
19. Thornicroft G, Mehta N, Clement S, Evans-Lacko S, Doherty M, Rose D, et al. Evidence for effective interventions to reduce mental-health-related stigma and discrimination. *Lancet.* (2016) 387:1123–32. doi: 10.1016/s0140-6736(15)00298-6
20. Corrigan P, Wassel A. Understanding and influencing the stigma of mental illness. *J Psychosoc Nurs Ment Health Serv.* (2008) 46:42–8. doi: 10.3928/02793695-20080101-04
21. Yuan Q, Picco L, Chang S, Abdin E, Cuha B, Ong S, et al. Attitudes to mental illness among mental health professionals in Singapore and comparisons with the general population. *PLoS One.* (2017). doi: 10.1371/journal.pone.0187593
22. Kadri N, Sartorius N. The global fight against the stigma of schizophrenia. *PLoS Med.* (2005) 2:e136. doi: 10.1371/journal.pmed.0020136
23. Knaak S, Modgill G, Patten S. Key ingredients of anti-stigma programs for health care providers: a data synthesis of evaluative studies. *Can J Psychiatry.* (2014) 59:19–26. doi: 10.1177/070674371405901s06
24. Lanfredi M, Macis A, Ferrari C, Rillosi L, Cadone E, Fanetti A, et al. Effects of education and social contact on mental health-related stigma among high-school students. *Psychiatry Res.* (2019) 281:112581. doi: 10.1016/j.psychres.2019.112581
25. Corrigan PW, Michaels PJ, Vega E, Gause M, Larson J, Krzyzanowski R, et al. Key ingredients to contact-based stigma change: A cross-validation. *Psychiatr Rehabil J.* (2014) 37:62–4. doi: 10.1037/prj0000038
26. Corrigan PW, Vega E, Larson J, Michaels PJ, McClintock G, Krzyzanowski R, et al. The California schedule of key ingredients for contact-based antistigma programs. *Psychiatr Rehabil J.* (2013) 36:173–9. doi: 10.1037/prj0000006 (accessed January 8, 2021).

27. Morgan A, Reavley N, Ross A, Too LS, Jorm A. Interventions to reduce stigma towards people with severe mental illness: Systematic review and meta-analysis. *J Psychiatr Res.* (2018) 103:120–33. doi: 10.1016/j.jpsychires.2018.05.017
28. Hickie I. Can we reduce the burden of depression? The Australian experience with beyondblue: the national depression initiative. *Australas Psychiatry.* (2004) 12:S38–S46. doi: 10.1111/j.1039-8562.2004.02097.x
29. Ministry of Health and Health Promotion Agency. *Like Minds, Like Mine National Plan 2014-2019: Programme to Increase Social Inclusion and Reduce Stigma and Discrimination for People with Experience of Mental Illness.* Wellington: Ministry of Health (2014).
30. Stuart H, Chen S, Christie R, Dobson K, Kirsh B, Knaak S, et al. Opening minds in canada: targeting change. *Can J Psychiatry.* (2014) 59:13–8. doi: 10.1177/070674371405901s05
31. Corrigan P, Rafacz J, Hautamaki J, Walton J, Rüsch N, Rao D, et al. Changing stigmatizing perceptions and recollections about mental illness: the effects of NAMI's in our own voice. *Community Ment Health J.* (2010) 46:517–22. doi: 10.1007/s10597-009-9287-3
32. Pelzang R. Attitude of nurses towards mental illness in Bhutan. *J Bhutan Studies.* (2010) 22:60–76. Available online at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.731.1095&rep=rep1&type=pdf (accessed November 11, 2020)
33. Corrigan P. Lessons learned from unintended consequences about erasing the stigma of mental illness. *World Psychiatry.* (2016) 15:67–73. doi: 10.1002/wps.20295
34. Lam A, Jorm A, Wong D. Mental health first aid training for the Chinese community in Melbourne, Australia: Effects on knowledge about and attitudes toward people with mental illness. *IJMHS.* (2010) 4:18. doi: 10.1186/1752-4458-4-18
35. Shann C, Martin A, Chester A, Ruddock S. Effectiveness and application of an online leadership intervention to promote mental health and reduce depression-related stigma in organizations. *J Occup Health Psychol.* (2019) 24:20–35. doi: 10.1037/ocp0000110
36. Amsalem D, Yang L, Jankowski S, Lieff S, Markowitz J, Dixon L. Reducing stigma toward individuals with schizophrenia using a brief video: a randomized controlled trial of young adults. *Schizophr Bull.* (2020) 2020:sbaa114. doi: 10.1093/schbul/sbaa114
37. Amsalem D, Gothelf D, Soul O, Dorman A, Ziv A, Gross R. Single-day simulation-based training improves communication and psychiatric skills of medical students. *Front Psychiatry.* (2020) 11:221. doi: 10.3389/fpsyt.2020.00221
38. Maunder RD, White FA, Verrelli S. Modern avenues for intergroup contact: using E-contact and intergroup emotions to reduce stereotyping and social distancing against people with schizophrenia. *GPIR.* (2019) 22:947–63. doi: 10.1177/1368430218794873
39. Cangas AJ, Navarro N, Aguilar JM, Trigueros R, Gallego J, Zárate R, et al. Analysis of the usefulness of a serious game to raise awareness about mental health problems in a sample of high school and university students: relationship with familiarity and time spent playing video games. *J Clin Med.* (2019) 8:1504. doi: 10.3390/jcm8101504
40. Mullor D, Sayans P, Cangas A, Navarro N. Effect of a Serious Game (Stigma-Stop) on reducing stigma among psychology students: a controlled study. *Cyberpsychol Behav Soc Netw.* (2019) 22:205–11. doi: 10.1089/cyber.2018.0172
41. Javed B, Sarwer A, Soto E, Mashwani Z. Impact of SARS-CoV-2 (coronavirus) pandemic on public mental health. *Public Health Front.* (2020) 8:292. doi: 10.3389/fpubh.2020.00292
42. Yao H, Chen J, Xu Y. Patients with mental health disorders in the COVID-19 epidemic. *Lancet Psychiatry.* (2020) 7:E21. doi: 10.1016/S2215-0366(20)30090-0
43. King B, Smith C. Using project-based learning to develop teachers for leadership. *J Educ Strat Issues Ideas.* (2020) 93:158–64. doi: 10.1080/00098655.2020.1735289
44. MacLeod M, van der Veen J. Scaffolding interdisciplinary project-based learning: a case study. *Eur J Eng Educ.* (2020) 45:363-77. doi: 10.1080/03043797.2019.1646210
45. Wang J, Tsiligiris V, Hartley R. Perceptions of the benefits of the A3 planner in facilitating project-based learning in accounting education. *JAEd.* (2019) 28:221–38. doi: 10.1080/09639284.2018.1516151
46. Bell B. Project-Based Learning for the 21st Century: Skills for the Future. *J Educ Strat Issues Ideas.* (2010) 83:39–43. doi: 10.1080/00098650903505415
47. Burke B, Currin-McCulloch J. Educating our future colleagues: creating an MSW palliative care practicum. *J Soc Work End Life Palliat Care.* (2019) 15:7–15. doi: 10.1080/15524256.2019.1586806
48. Leggett G, Harrington I. The impact of Project Based Learning (PBL) on students from low socio economic statuses: a review. *Int J Incl Educ.* (2019) 1–17. doi: 10.1080/13603116.2019.1609101
49. Chen CH, Yang YC. Revisiting the effects of project-based learning on students' academic achievement: a meta-analysis investigating moderators. *Educ Res Rev.* (2019) 26:71–81. doi: 10.1016/j.edurev.2018.11.001
50. Hunt J, Brannan E, Sexson S. Lifelong learning for professional development in psychiatry: pedagogy, innovations, and maintenance of certification. *Psychiatr Clin N.* (2019) 42:425–37. doi: 10.1016/j.psc.2019.05.014
51. Bokken L, Rethans JJ, Jöbsis Q, Duvivier R, Scherpbier A, van der Vleuten C. Instructiveness of real patients and simulated patients in undergraduate medical education: a randomized experiment. *Acad Med.* (2010) 85:148–54. doi: 10.1097/ACM.0b013e3181c48130
52. Karim A, Campbell M, Hasan M. A new method of integrating project-based and work-integrated learning in postgraduate engineering study. *Curric J.* (2019) 31:157–73. doi: 10.1080/09585176.2019.1659839
53. Schomerus G, Angermeyer MC, Baumeister SE, Stolzenburg S, Link BG, Phelan JC. An online intervention using information on the mental health-mental illness continuum to reduce stigma. *Eur Psychiatry.* (2016) 32:21–7. doi: 10.1016/j.eurpsy.2015.11.006
54. Martin A, Krause R, Jacobs A, Chilton J, Amsalem D. The mental status exam through video clips of simulated psychiatric patients: an online educational resource. *Acad Psychiatry.* (2020) 44:179–83. doi: 10.1007/s40596-019-01140-9
55. Tippin GK, Maranzan KA. Efficacy of a Photovoice-based video as an online mental illness anti-stigma intervention and the role of empathy in audience response: A randomized controlled trial. *J Appl Soc Psychol.* (2019) 49:381–94. doi: 10.1111/jasp.12590
56. Martin A, Krause R, Chilton J, Jacobs A, Amsalem D. Attitudes to psychiatry and to mental illness among nursing students: adaptation and use of two validated instruments in preclinical education. *J Psychiatr Ment Health Nurs.* (2020) 27:308–17. doi: 10.1111/jpm.12580
57. White F, Abu-Rayya H. A dual identity-electronic contact (DIEC) experiment promoting short-and long-term inter-group harmony. *J Exp Soc Psychol.* (2012) 48:597–608. doi: 10.1016/j.jesp.2012.01.007
58. Hodson G. Do ideologically intolerant people benefit from intergroup contact? *Curr Dir Psychol.* (2011) 20:154–9. doi: 10.1177/0963721411409025
59. White F, Turner R, Verrelli S, Harvey L, Hanna J. Improving intergroup relations between catholics and protestants in Northern Ireland via E-contact. *Eur J Soc Psychol.* (2019) 49:429–38. doi: 10.1002/ejsp.2515
60. Boccanfuso E, White FA, Maunder RD. Reducing transgender stigma via an E-contact intervention. *Sex Roles.* (2020) 1–11. doi: 10.1007/s11199-020-01171-9
61. Martin A, Chilton J, Paasche C, Nabatkhorian N, Gortler H, Cohenmehr E, et al. Shared living experiences by physicians have a positive impact on mental health attitudes and stigma among medical students: a mixed-methods study. *J Med Educ Curric Dev.* (2020) 7:1–9. doi: 10.1177/2382120520968072
62. Schulze B, Richter-Werling M, Matschinger H, Angermeyer M.C. Crazy? So what! Effects of a school project on students' attitudes toward people with schizophrenia. *Acta Psychiatr Scand.* (2003) 107:142–50. doi: 10.1034/j.1600-0447.2003.02444.x
63. Navarro N, Cangas A, Aguilar-Parra J, Gallego J, Moreno-San Pedro E, Carrasco-Rodríguez Y, et al. Propiedades psicométricas de la versión en castellano del cuestionario de las actitudes de los estudiantes hacia la esquizofrenia. *Psychol Soc Educ.* (2017) 9:325–34. doi: 10.25115/psye.v9i2.865
64. Corrigan P, Markowitz F, Watson A, Rowan D, Kubiak M. An attribution model of public discrimination towards persons with mental illness. *J Health Soc Behav.* (2003) 44:162–79. doi: 10.2307/1519806
65. Saavedra J, Arias-Sánchez S, Corrigan P, López M. Assessing the factorial structure of the mental illness public stigma in Spain. *Disabil Rehabil.* (2020) 6:1–7. doi: 10.1080/09638288.2019.1710769

66. Asociación Médica Mundial. *Declaración de Helsinki de la AMM – Principios Éticos Para las Investigaciones Médicas en Seres Humanos.* (2017). Available online at: https://www.wma.net/es/policies-post/declaracion-de-helsinki-de-la-amm-principios-eticos-para-las-investigaciones-medicas-en-seres-humanos/ (accessed November 11, 2020).
67. Resnik D, Shamoo A. The Singapore statement on research integrity. *Account Res.* (2011) 18:71–5. doi: 10.1080/08989621.2011.557296
68. Howells FM, Kingdon DG, Baldwin DS. Current and potential pharmacological and psychosocial interventions for anxiety symptoms and disorders in patients with schizophrenia: structured review. *Hum Psychopharmacol.* (2017) 32:5. doi: 10.1002/hup.2628
69. Khokhar JY, Dwiel LL, Henricks AM, Doucette WT, Green AI. The link between schizophrenia and substance use disorder: a unifying hypothesis. *Schizophr Res.* (2018) 194:78–85. doi: 10.1016/j.schres.2017.04.016
70. Wahl O, Aroesty-Cohen E. Attitudes of mental health professionals about mental illness: a review of the recent literature. *J Community Psychol.* (2010) 38:49–62. doi: 10.1002/jcop.20351
71. Stefanovics E, Rosenheck R, He H, Ofori-Atta A, Cavalcanti M, Chiles C. Medical student belief and attitudes toward mental illness across five nations. *J Nerv Ment Dis.* (2016) 204:909–15. doi: 10.1097/NMD.0000000000000610
72. Gallego J, Cangas A, Aguilar J, Trigueros R, Navarro N, Galván B, et al. Education students' stigma toward mental health problems: a cross-cultural comparison. *Front Psychiatry.* (2020) 11:587321. doi: 10.3389/fpsyt.2020.587321
73. Kemp C, Jarrett B, Kwon C, Song L, Jetté N, Sapag J, et al. Implementation science and stigma reduction interventions in low- and middle-income countries: a systematic review. *BMC Med.* (2019) 17:6. doi: 10.1186/s12916-018-1237-x
74. Maunder RD, White F. Intergroup contact and mental health stigma: A comparative effectiveness meta-analysis. *Clin Psychol Rev.* (2019) 72:1749. doi: 10.1016/j.cpr.2019.101749
75. Kitay B, Martin A, Chilton J, Amsalem D, Duvivier R, Goldenberg M. Electroconvulsive therapy: a video-based educational resource using standardized patients. *Acad Psychiatry.* (2020) 44:531–7 doi: 10.1007/s40596-020-01292-z
76. Nickerson A, Byrow Y, Pajak R, McMahon T, Bryant R, Christensen H, et al. 'Tell Your Story': A randomized controlled trial of an online intervention to reduce mental health stigma and increase help-seeking in refugee men with posttraumatic stress. *Psychol Med.* (2020) 50:781–92. doi: 10.1017/S0033291719000606
77. Inan FS, Günüşen N, Duman ZÇ, Ertem MY. The impact of mental health nursing module, clinical practice and an anti-stigma program on nursing students' attitudes toward mental illness: a quasi-experimental study. *J Prof Nurs.* (2019) 35:201–8. doi: 10.1016/j.profnurs.2018.10.001
78. Koike S, Yamaguchi S, Ojio Y, Ohta K, Shimada T, Watanabe K, et al. A randomised controlled trial of repeated filmed social contact on reducing mental illness-related stigma in young adults. *Epidemiol Psychiatr Sci.* (2018) 27:199–208. doi: 10.1017/S2045796016001050
79. Dedeilia A, Sotiropoulos MG, Hanrahan JG, Janga D, Dedeilias P, Sideris M. Medical and surgical education challenges and innovations in the COVID-19 era: a systematic review. *In Vivo.* (2020) 34(3 Suppl):1603–11. doi: 10.21873/invivo.11950
80. Chick RC, Clifton GT, Peace KM, Propper BW, Hale DF, Alseidi AA, et al. Using technology to maintain the education of residents during the COVID-19 pandemic. *J Surg Educ.* (2020) 77:729–32. doi: 10.1016/j.jsurg.2020.03.018
81. Tabatabai S. COVID-19 impact and virtual medical education. *J Adv Med Educ Prof.* (2020) 8:140–3. doi: 10.30476/jamp.2020.86070.1213
82. Sabharwal S, Ficke JR, LaPorte DM. How we do it: modified residency programming and adoption of remote didactic curriculum during the COVID-19 pandemic. *J Surg Educ.* (2020) 77:1033–6. doi: 10.1016/j.jsurg.2020.05.026
83. Amsalem D, Gothelf D, Dorman A, Goren Y, Tene O, Shelef A, et al. Reducing stigma toward psychiatry among medical students: a multicenter controlled trial. *Prim Care Companion CNS Disord.* (2020) 22:19m02527. doi: 10.4088/PCC.19m02527
84. López M, Laviana M, Fernández L, López A, Rodríguez AM, Aparicio A. La lucha contra el estigma y la discriminación en salud mental. Una estrategia compleja basada en la información disponible. *Rev Asoci Esp Neuropsiquiatr.* (2008) 28:48–83. doi: 10.4321/S0211-573520080001 00004

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

frontiers in Psychology

ORIGINAL RESEARCH
published: 19 February 2021
doi: 10.3389/fpsyg.2021.614787

The Mediating Role of Stress Perception in Pathways Linking Achievement Goal Orientation and Depression in Chinese Medical Students

*Yan Wang, Luping Liu, Ning Ding, Honghe Li and Deliang Wen**

Institute for International Health Professions Education and Research, China Medical University, Shenyang, China

OPEN ACCESS

Edited by:
Robbert Duvivier, Parnassia Psychiatric Institute, Netherlands

Reviewed by:
Evangelia Karagiannopoulou, University of Ioannina, Greece
Ru Zhang, South China Normal University, China

***Correspondence:**
Deliang Wen
dlwen@cmu.edu.cn

Specialty section:
This article was submitted to Educational Psychology, a section of the journal Frontiers in Psychology

Received: *07 October 2020*
Accepted: *06 January 2021*
Published: *19 February 2021*

Citation:
Wang Y, Liu L, Ding N, Li H and Wen D (2021) The Mediating Role of Stress Perception in Pathways Linking Achievement Goal Orientation and Depression in Chinese Medical Students. Front. Psychol. 12:614787. doi: 10.3389/fpsyg.2021.614787

Mental health problems are frequent obstacles in medical students' careers as doctors. Given that previous studies overlook the mediation of stress perception, the current study expanded previous goal orientation researches by addressing an unexplored mechanism. This study aims to examine the mediational roles of stress perception (perceived stressors and stress-related cognition) on the relationship between achievement goal orientation and depression in medical students. A total of 1,015 Chinese 2-year medical students completed a multi-section questionnaire. Hypotheses were examined by structural equation modeling. The findings suggest that performance-avoidance goal orientation and perceived stressors both demonstrated direct facilitative effects on depression, whereas stress-related cognition demonstrated direct obstructive effects on depression. Both perceived stressors and stress-related cognition mediated the relationship between achievement goal orientation and depression. The findings spark a new perspective on motivational intervention that assist students in adopting mastery-approaching strategy as well as ways of coping with stressful academic situations. Identifying students with achievement goal orientation and providing them with the appropriate supportive services may help them to manage stress and mitigate or prevent depression.

Keywords: achievement goal orientation, stress perception, depression, cognitive evaluation, medical students

Abbreviations: AN, Anhedonia; CES-D, Center for Epidemiological Studies-Depression scale; CFA, Confirmatory factor analysis; CFI, Comparative fit index; CI, Confidence intervals; DA, Depressive affect; DS, Depressive symptoms; EFA, Exploratory factor analysis; GAS, General Adaptation syndrome; MAP, Mastery-approach; MAV, Mastery-avoidance; PAP, Performance-approach; PAV, Performance-avoidance; PS, Perceived stressor; RMSEA, Root mean square error of approximation; SC, Somatic concerns; SEM, Structural equation model; SRC, Stress-related cognition; SRMR, Standardized root mean square residual; TLI, Tucker-Lewis index.

INTRODUCTION

Worldwide, medical schools have a large challenge of creating an academic environment that motivates students to engage in rigorous learning without compromising their health. In general, compared with students of other disciplines or the general population, students in medical school experience higher levels of psychological stress (Steiner-Hofbauer and Holzinger, 2020). A systematic review indicated that the prevalence of depression among medical students was 27.2% (Hope and Henderson, 2014; Rotenstein et al., 2016). Similarly, in China, more than 20% of medical students had depression, a rate that has continued to grow over the past decade (Gao et al., 2020; Shen et al., 2020). Medical students' depression deserves distinct attention, it may affect students' careers in terms of difficulty concentrating, academic performance, professional development, and may cause a variety of problems, such as dropout, identity confusion, and more cynical, less empathetic in doctor-patient relationship (Dyrbye et al., 2006).

Previous studies have suggested that beliefs (cognitive vulnerabilities) and goals (to prove self-worth) contribute to depression (Street, 2002; Rothbaum et al., 2009). Moreover, the etiology for depression has also been strongly associated with deficits in motivational and incentive functions, as goal setting and goal pursuit is presumed to be a key factor in the diagnosis of major depressive disorder. Thus, goal motivation plays a critical role in the occurrence of depression (Vergara and Roberts, 2011). Early motivation research focused primarily on a physiological point of view. In recent years, numerous studies focus on goal-orientation theory. The type of students' academic goals is a primary variable in motivational research in an educational context (Valle et al., 2003; Meece et al., 2006). A goal may be defined as a comprehensive pattern of belief, attributions, and affects/feelings that guides action (Weiner, 1985). It is considered to determine individuals' cognitive, affective, and behavioral response to challenges, success and failure. The goal orientation theory attempts to explain the reasons behind individual behavior; why learners set goals and how they achieve them (Vandewalle et al., 2019). In a social cognitive perspective, goal-orientation theory emphasizes the ways in which the perceived goal orientation in a learning context interacts with the learning process.

Elliot's four-factor goal-oriented model is a widely acceptable achievement goal framework. It is comprised of mastery-approach (MAP) orientation, mastery-avoidance (MAV) orientation, performance-approach (PAP) orientation, and performance-avoidance (PAV) orientation (Elliot, 1999). Individuals who hold a MAP goal orientation tend to focus on ways to effectively master knowledge and understand the content and then develop their own abilities. A MAV goal orientation focuses on avoiding incompetency and preventing the loss of mastery over a task and tends to hold negative qualities, such as fear of failure and a low sense of self-determination. While individuals who hold a performance-approach goal orientation tend to focus on how to achieve better results, adopting this type of goal often allows for the acquisition of skills in order to try to outdo others to prove their abilities and superiority, with the intent of gaining a positive evaluation from others. Individuals who hold a performance-avoiding goal orientation tend to focus on how to avoid adverse evaluations of themselves (Tuominen-Soini et al., 2008). Several studies posit that adopting a self-worth goal orientation (e.g., seeking self-validation and avoiding proof of worthlessness) may make individuals more vulnerable to depression, while pursuing learning goals (seeking personal growth and improving one's abilities) may introduce a protective factor (Street, 2002). Therefore, we hypothesize:

Hypothesis 1: A mastery-approach (MAP) orientation may offered a protective effect on depression;

Hypothesis 2: A performance-avoidance (PAV) orientation may make individuals more vulnerable to depression.

Though we postulated that individuals' goal-orientation could result in either vulnerable or resistant to depression, how the effect work is still unclear. To this point, research on the effects of goal-orientation strategy on depression have focused on the mediating variables of negative events (Sideridis, 2007). Recent research has demonstrated a unidirectional link between goal-directed rumination and psychological distress, especially in terms of perceived stress (Krys et al., 2020). So far, numerous evidence supports stress as a cause of depression. Stress, which affects individuals' behaviors, communications, and efficiencies, is defined as the sum of the non-specific responses of the body to various internal or external stimuli. It can be defined as an automatic physical response to any stimulus that requires you to adjust to change. Every real or perceived threat to body triggers a cascade of stress hormones that produces physiological changes (Ursin and Eriksen, 2007).

Cognitive stress theory posits that stress is an individual's perception of the environment and undergoes a dynamic appraisal process (Lazarus and Richard, 1966). Cognitive assessment is an intermediate variable, between the stimulus and the response. The difference in cognitive assessment is affected by the structure of stress factors, unique individual traits, the amount of resources, and belief systems, among other things. In other words, individual traits (such as motivation characteristics) play a key role in whether a stimulus becomes a stressor for an individual and how much that individual is threatened by the stress (Baumann et al., 2005). The current study adopts the concept of stress perception, which is an individual's physiological and psychological response to the environment through the process of that individual's dynamic cognitive evaluation and includes not only the perceived stressors, but also the stress-related cognition. It should be noted that, a recent study showed that goal-orientation strategy is not only associated with stress perception, but also seems to be a cause of it and, as such, is viewed as a threat to depression (Vandewalle et al., 2019). Perceived goal orientation strategy is characterized as a type of stressor in which the appraisal of a potential threat plays a primary role. In addition, goal-orientation theory assumes that individuals pursue different types of implicit motivational goals, accompanied by striking differences in strategy change under stressful situations. Deterioration in performance links to a helpless response pattern (the perceived inability to surmount

failure), while mastery-oriented tends to focus on remedies for failure responses (Diener and Dweck, 1978; Wooley et al., 1978). Therefore, we hypothesize:

Hypothesis 3: Both perceived stress and stress related cognition play important roles in depression occurrence.

Hypothesis 4: Stress (both perceived stress and stress related cognition) plays a mediating role between goal orientation and depression.

The kind of personal goals may not only directly influence depression, but may, by means of one's appraisal of stress, result in depression (Vandewalle et al., 2019). Although previous research has shown that both motivational and cognitive factors can play an important role in rendering depression, less is known about the role of motivational and cognitive factors in the maintenance of depression due to stressful medical learning environment. It should be noted that, while numerous studies have explored the manner of goal attainment for the depressed individual, there is a dearth of research that examines why some individuals adopt goal orientation that in a pattern that creates a vulnerability to depression.

In sum, previous findings emphasize the integration of motivational and cognitive factors, such as goal orientation and the perception of stress, in order to recognize the different pathways that may bring about or perpetuate depression, but little consideration of how they work in tandem. The current study synthesized the evidence from existing studies and aimed to examine the relationship among medical students' achievement goal orientation, stress perception, and depression. Moreover, in our study, we need to develop a stress perception scale which includes the stressors, the subjective experience of the stressors, the coping style, and the stress result, allowing for the clear measurement of the stress of Chinese college students. As such, the current study may contribute to implications for interventions and therapy by: (1) investigating the direct effects of goal orientation strategy as well as the perceived stressor and stress-related cognition on depression and; (2) examining the indirect effect of achievement goal orientation on depression through the perceived stressor and stress-related cognition. It may conduce to alleviate depression that help individuals put right existing maladaptive goal orientation and stress perception.

MATERIALS AND METHODS

Procedure

This study was approved by the Human Research Ethics Committee of China Medical University. The ethical principles of the Declaration of Helsinki were respected at all times (beneficence, non-maleficence, autonomy, and justice). From March to May 2014, all medical undergraduates in their second year at China Medical University (a total of 1,186) were included for the survey. The self-report scales were administered to groups of approximately 30 students at a time (after their class meeting) in a regular classroom environment by a trained assistant. Questionnaires describing the study and consent forms were distributed to medical students. Participation was completely voluntary and anonymous. The questionnaires were collected immediately upon completion. Only students who returned consent forms were enrolled in the study. The resulting of 1,015 students agreed to participate the study and completed the questionnaires, yielding a response rates of 85.58%. There were only 16 incomplete questionnaires. The missing items of each incomplete questionnaire are less than 4.

Participants

All participants were second year medical students and ages ranged from 18 to 24 years. The mean age of the participants was 20.39 years (SD = 0.831). The sample consisted of 1,015 medical students, of whom 66.9% (n = 679) were women and 24.9% females. The majority were Han people, 125 students (12.3%) were Ethnic minorities. 344 students (33.9%) were student cadre. 20.9% of them (212 persons) came from single-parent family. 239 students (23.6%) came from government accredited poverty families. Approximately 22.0% (n = 223) had monthly household income up to ¥1,000, 26.5% (n = 269) had between ¥1,001 and ¥2,000, 22.8% (n = 231) had between ¥2,001 and ¥3,000, and 28.8% (n = 292) had income of more than ¥3,001. The sample characteristics are shown in **Table 1**.

Measures

Achievement Goal Orientations Scale

The achievement goal orientations scale is a 29-item self-report measure of goal orientation. The Chinese revised version of the achievement goal orientations scale was used (Liu and Guo, 2003), which is based on the Elliot model. The goal orientation scale includes four dimensions. The dimension of mastery-approach goals consists of nine items (items 1, 5, 7, 10, 14, 17, 19, 22, 25), a focus on task mastery, learning, and understanding and evaluates performance based on progress and improvement. The dimension of performance-approach goals consists of nine items (items 3, 6, 9, 12, 13, 18, 24, 26, 29), including caring about how to surpass others. The dimension of mastery-avoidance goals consists of five items (items 4, 11, 20, 23, 27), with individuals primarily being concerned about avoiding incomprehension. The dimension of performance-avoidance goals consists of six items (items 2, 8, 15, 16, 21, 28), with individuals primarily being concerned about how not to make oneself look stupid. Given a 5-point scale, response options ranged from 1 (completely disagree) to 5 (completely agree).

Stress Perception Scale

A standardized procedure was followed for the development of a new scale (Ntoumanis et al., 2005). According to social readjustment rating scale (Holmes and Rahe, 1967), perceived stress scale (Cohen et al., 1983), relevant stress literature in individual reports (Keller et al., 2012), we designed an interview outline for medical students. The interview contained three open questions: 'what kind of stressors are you experiencing

TABLE 1 | Descriptive characteristics of study sample (N = 1,015).

Variables	Total		Non-depression (CES-D score < 20)	Depression (CES-D score ≥ 20)	χ2	*P*
	n	%	*n* (%)	*n* (%)		
Gender					2.121	0.145
Female	679	66.9%	510 (68.2%)	169 (63.3%)		
Male	336	33.1%	238 (31.8%)	98 (36.7%)		
Ethnicity					2.229	0.135
Han	890	87.7%	649 (86.8%)	241 (90.3%)		
Minorities	125	12.3%	99 (13.2%)	26 (9.7%)		
Student cadre					5.443	0.020
No	671	66.1%	479 (64%)	192 (71.9%)		
Yes	344	33.9%	269 (36%)	75 (28.1%)		
Family type					0.842	0.359
Two-parent	803	79.1%	597 (79.8%)	206 (77.2%)		
Single-parent	212	20.9%	151 (20.2%)	61 (22.8%)		
Family income					4.229	0.238
≤1000	223	22.0%	162 (21.7%)	61 (22.8%)		
1001-2000	269	26.5%	189 (25.3%)	80 (30%)		
2001-3000	231	22.8%	170 (22.7%)	61 (22.8%)		
>3000	292	28.8%	227 (30.3%)	65 (24.3%)		
Government accredited poverty					7.345	0.007
No	776	76.5%	588 (78.6%)	188 (70.4%)		
Yes	239	23.6%	160 (21.4%)	79 (29.6%)		
Academic performance (self-report)					14.655	0.002
Excellent	41	4.0%	35 (4.7%)	6 (2.2%)		
Good	228	22.5%	183 (24.5%)	45 (16.9%)		
Fair	577	56.9%	420 (56.1%)	157 (58.8%)		
Poor	169	16.7%	110 (14.7%)	59 (22.1%)		

in your current learning and life,' 'what role does stress play in your daily learning and life' and 'how do you deal with stressors.' In medical students' interview, saturation occurred at a sample size 22. Fourteen items based on fore-mentioned scales and interviews were subsequently created and reviewed by three psychologists (the faculties of China Medical University) to confirm the academic relevance. The presentation of four items were modified according to the experts' suggestion, which yielded the initial version V1.0. This version was then tested in a small sample of 248 medical students. After reliability and validity analysis, eleven items (3 items with factor loadings less than 0.4 were excluded, **Supplementary Table 1**) were selected as the final version V2.0. V2.0 Scale comprises eight related to the perceived stressor items and three stress-related cognition involving items. Cronbach's alpha values, composite reliability coefficients, and average variance extracted for the scale are shown in **Supplementary Table 2**.

Perceived stressor sub-scale were classified into three potential stressor domains, namely academic performance pressure, self-development trends, and social stressors. Responses used the original 5-point Likert format from 'strongly does not fit me' to 'strongly fit me.' Stress-related cognition is defined as an individual's perception of stress that affects their health and health outcomes, as well as who they ask for help. Stress-related cognition sub-scale mainly includes three items: amount of Stress, perception of stress affecting learning and life, and inquiry of help for stress reduction. Responses were modeled using the original 5-point Likert format. Exploratory factor analysis and confirmatory factor analysis were used to confirm a good measurement parameter in the present study (as shown in **Tables 2**, **3**).

Center for Epidemiological Studies-Depression Scale (CES-D)

The CES-D has been considered to be a validated scale of depression (Radloff, 1977; Zhang et al., 2010). Previous studies have indicated that the CES-D scale is a valid measure for the assessment of depression in Chinese university students (Ling et al., 2016; Jiang et al., 2019). It contains 20 items with a 4-point rating scale scored "0" (rarely) to "3" (all of the time). Higher score indicates severer depressive symptoms. The current study adopted a cut-off score of 20 for detecting subthreshold depression. The CES-D has been validated in Chinese samples, for which a three-factor model was the best fit (Jiang et al., 2018). The three factors were somatic concerns (items 1, 2, 3, 5, 6, 7, 9, 18, 11), depressive affect (items 10, 13, 14, 15, 17, 19, 20), and anhedonia (items 4, 8, 12, 16).

Control Variables

To control for potential effects of socio-demographic characteristics, the following variables were measured:

TABLE 2 | Confirmatory factor analysis for three scales.

Factor Model	χ^2	df	χ^2/df	*P*-Value	RMSEA	90% C.I.		CFI	TLI	SRMR
Achievement goal orientation										
Four first-order factors	193.54	41	4.721	<0.001	0.055	0.047	0.064	0.946	0.928	0.047
Stress perception										
Two first-order factors	992.54	337	2.945	<0.001	0.039	0.035	0.042	0.920	0.903	0.053
Center for Epidemiological Studies-Depression										
Three first-order and a second-order factors	581.12	166	3.501	<0.001	0.042	0.037	0.046	0.944	0.936	0.036

TABLE 3 | Cronbach's alpha values for three scales.

Scale	Cronbach's alpha
Achievement goal orientation	
Total	0.83
Mastery-Approach (MAP)	0.78
Performance-Approach (PAP)	0.79
Performance-Avoidance (MAV)	0.72
Mastery-Avoidance (PAV)	0.78
Stress perception	
Total	0.81
Perceived Stressors (PS)	0.80
Stress Related Cognition (SRC)	0.71
Center for Epidemiological Studies-Depression	
Total (Depressive Symptoms, DS)	0.90
Somatic Concerns (SC)	0.83
Depressive Affect (DA)	0.82
Anhedonia (AN)	0.69

participants' gender (0 = male, 1 = female), ethnicity (0 = Han, 1 = Ethnic Minority), family type (0 = two-parent, 1 = single-parent), and family income (1 = $\leq$ 1000, 2 = 1001-2000, 3 = 2001-3000, and 4 $\geq$ 3000). The aforementioned variables are known to be related to quantitative stress perception and depression (e.g., Cheung and Bagley, 1998; Ryder et al., 2008; Park and Lee, 2020). We performed a hierarchical regression analysis in which depression symptoms was regressed on achievement goal orientation, stress perception and the control variables. The control variables were not significantly related to depression. Therefore, the control variables were excluded from further analyses.

Data Analysis

Missing data were replaced using the median of a nearby point. Initial descriptive statistics and Pearson correlations were conducted in SPSS 25.0. Exploratory factor analysis was conducted in SPSS 25.0 and then a confirmatory factor analysis (CFA) using Mplus 8.3 was performed to test the factorial structure of each scale (Ryu, 2011). A structural equation model (SEM) was used to examine the effects of goal orientation on depression through PS and SRC (Yang et al., 2019; van Dam et al., 2020). A bootstrapping method with 1,000 samples and 95% confidence intervals (CI) was used to verify mediation effects (using Mplus 8.3). Model fit indices above a value of 0.90 for the ML-based indices (TLI, CFI), lower than 0.08 for SRMR, and lower than 0.06 for RMSEA are recommended as best practice (Hu and Bentler, 1999).

RESULTS

Sample Characteristics of Depression

The sample consisted of 1,015 medical students, 24.9% females and 29.2% males were considered to have depressive symptoms (CES-D score $\geq$ 20). More detailed information on sample characteristics can be found in **Table 1**. The chi-square test demonstrated that those in a student cadre group had a lower depression rate than those in a non-student cadre group, the government accredited poverty group had higher depression rate than non-government accredited poverty group, and the good academic performance group had a lower depression rate than the poor academic performance group.

Reliability and Validity Analysis of the Goal Orientation Scale, Stress Perception Scale, and Center for Epidemiological Studies Depression Scale (CES-D)

The factorial structure of each scale was first explored by EFA and then tested via CFA. The results showed that all scales demonstrated acceptable fit indices with acceptable factor loadings (all loadings $p < 0.001$). **Table 2** summarizes the model fit of statistics for the three scales. The results of the current study support a four first-order factors structure, namely mastery-approach (MAP) goal orientation, performance-approach (PAP) goal orientation, mastery-avoidance (MAV) goal orientation, and performance-avoidance (PAV) goal orientation for an achievement goal orientation scale. Furthermore, the current study lend support for a two first-order factors structure, namely perceived stressor (PS) and stress-related cognition (SRC) for the stress perception scale and a three first- and second-order factor structure, namely the second-order factor is measured by three first-order factors somatic concerns (SC), depressive affect (DA), and anhedonia (AN) for the CES-D scale. As reported in **Table 3**, Cronbach's alpha demonstrated good reliability and internal consistency for the three scales. Factor loadings, composite reliability coefficients, and average variance extracted for the variables are shown in **Supplementary Tables 3–6**. The

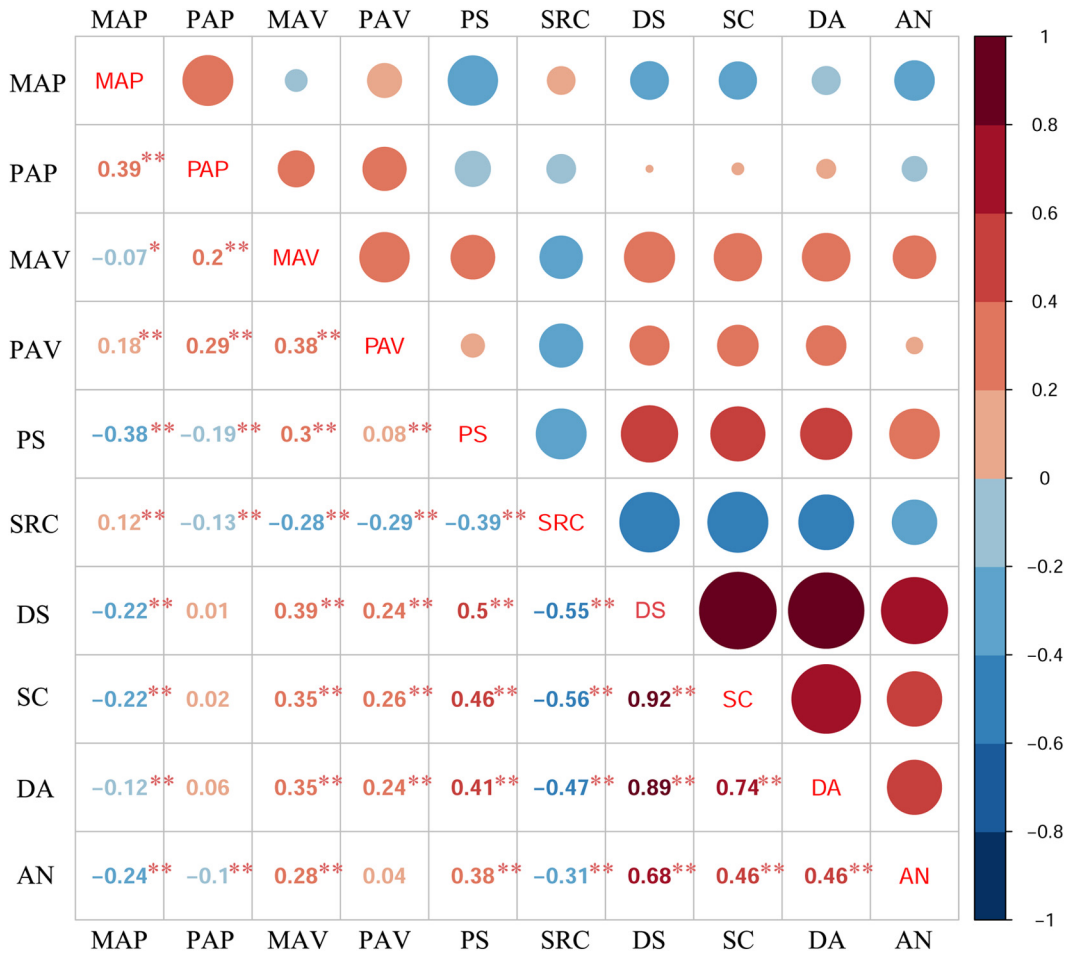

FIGURE 1 | Correlations between study variables. Note: *$p < 0.05$, **$p < 0.01$.

zero-order correlations (r-values) among study variables are presented in **Figure 1**.

Description of Academic Performance Characteristics of Study Variables

As the study variables are moderate to high levels of non-normality, which may create problems in analyses, all study variables in the current study for self-report academic performance characteristics among achievement goal orientation, stress perception, and the CES-D used non-parametric tests. As shown in **Table 4**, a Kruskal-Wallis H test revealed that academic performance had a significant effect on the level of MAP ($\chi^2 = 56.265$, $p < 0.001$), PAP ($\chi^2 = 40.208$, $p < 0.001$), MAV ($\chi^2 = 12.606$, $p < 0.001$), PAV ($\chi^2 = 8.673$, $p < 0.001$), PS ($\chi^2 = 33.875$, $p < 0.001$), DS ($\chi^2 = 17.897$, $p < 0.001$), SC ($\chi^2 = 16.156$, $p < 0.001$), and AN ($\chi^2 = 20.662$, $p < 0.001$). Dunn's *post hoc* multiple comparisons test revealed that, compared with the poor academic performance group, the excellent academic performance group had a higher level of MAP ($p = 0.002$) and the good academic performance group had a higher level of MAP ($p < 0.001$) and PAP ($p < 0.001$), whereas the excellent academic performance group had a lower level of MAV ($p = 0.011$), PS ($p = 0.005$), DS ($p = 0.016$), SC ($p = 0.018$), and NA ($p = 0.006$) and the good academic performance group had a lower level of PAV ($p = 0.028$), PS ($p < 0.001$), DS ($p = 0.001$), SC ($p = 0.002$), and NA ($p = 0.001$). Compared with the fair academic performance group, the excellent academic performance group had a lower level of MAV ($p = 0.026$), the good academic performance group had a lower level of PS ($p < 0.001$) and AN ($p = 0.04$), and the poor academic performance group had a lower level of MAP ($p = 0.001$), whereas the good academic performance group had a higher level of MAP ($p < 0.001$) and PAP ($p < 0.001$).

The Measurement and Structural Models

The SEM comprises a measurement model and a structural model. The model fit information of each full measurement model are presented in **Table 5**. All indicators are acceptable. Next, the structural model component was conducted to test whether achievement goal orientation is predictive of depressive symptoms and whether stress perception acts as a mediator in the relationship between goal orientation and depression (DS, SC,

TABLE 4 | The detail of academic performance characteristics of participants and their scale scores.

Variables	Total		Academic performance (self-report)									
			Excellent		Good		Fair		Poor		H	*P*
	Mean ± SD	*n* (missing)	Mean ± SD	*n*	Mean ± SD	*n*	Mean ± SD	*n*	Mean ± SD	*n*		
Achievement goal orientation												
MAP	31.01 ± 28.34	1010 (5)	32.54 ± 5.42**	41	32.90 ± 4.46##**	227	30.84 ± 5.04	574	28.65 ± 6.26##	168	56.265	<0.001
PAP	31.61 ± 33.12	1012 (3)	32.27 ± 6.69	41	33.69 ± 5.29##**	226	31.26 ± 5.3	576	29.87 ± 6.77	169	40.208	<0.001
MAV	13.71 ± 21.87	1013 (2)	11.56 ± 4.03##**	41	13.18 ± 4.09	228	13.9 ± 4.66	575	14.33 ± 5.39	169	12.606	0.006
PAV	16.58 ± 14.39	1013 (2)	16.20 ± 4.65	41	17.11 ± 3.77*	228	16.59 ± 3.6	575	15.94 ± 4.15	169	8.673	0.034
Stress perception												
PS	20.83 ± 25.58	1009 (6)	19.10 ± 4.55**	41	19.42 ± 4.18##**	226	21.10 ± 5.22	573	22.18 ± 5.20	169	33.875	<0.001
SRC	11.17 ± 4.64	1014 (1)	11.73 ± 1.70	41	11.30 ± 2.20	228	11.16 ± 2.10	576	10.91 ± 2.34	169	6.105	0.107
CES-D (Depression)												
DS	15.39 ± 83.47	1015 (0)	12.54 ± 7.78*	41	13.81 ± 8.32**	228	15.56 ± 9.05	577	17.6 ± 10.22	169	17.891	<0.001
SC	7.23 ± 21.00	1015 (0)	6.00 ± 4.12*	41	6.59 ± 4.17**	228	7.21 ± 4.50	577	8.47 ± 5.22	169	16.156	0.001
DA	4.66 ± 13.27	1015 (0)	3.98 ± 3.22	41	4.10 ± 3.27	228	4.78 ± 3.56	577	5.17 ± 4.34	169	7.508	0.057
AN	3.50 ± 6.03	1015 (0)	2.56 ± 1.94**	41	3.12 ± 2.52#**	228	3.57 ± 2.42	577	3.97 ± 2.49	169	20.662	<0.001

**compared with Poor group, P < 0.05; **compared with Poor group, P < 0.01; #compared with Fair group, P < 0.05; ##compared with Fair group, P < 0.01.*

TABLE 5 | Model fit information for the measurement model.

Model	SEM Model (Bootstrap = 1000)	χ^2	df	χ^2/df	*P*-Value	RMSEA	90% C.I.	CFI	TLI	SRMR
Model 1	MAP/PAP/MAV/PAV→PS/SRC→DS	827.91	228	3.63	<0.001	0.051	0.047 0.055	0.940	0.927	0.047
	MAP/PAP/MAV/PAV→PS/SRC→SC	517.53	131	3.95	<0.001	0.054	0.049 0.059	0.947	0.931	0.042
	MAP/PAP/MAV/PAV→PS/SRC→DA	473.13	131	3.61	<0.001	0.051	0.046 0.056	0.951	0.936	0.041
	MAP/PAP/MAV/PAV→PS/SRC→AN	438.46	114	3.85	<0.001	0.053	0.048 0.058	0.948	0.930	0.043
Model 2	PS/SRC→MAP/PAP/MAV/PAV→DS	827.91	228	3.63	<0.001	0.051	0.047 0.055	0.940	0.927	0.047

DA, or AN). Item parceling (dividing by factor loading and item content) was used and each variable had two or three packs (Jiang et al., 2018). All indices showed excellent model fit. All factor loadings for mastery-approach (MAP), performance-approach (PAP), mastery-avoidance (MAV), performance-avoidance (PAV), perceived stressors (PS), stress-related cognition (SRC), depressive symptom (DS), somatic concerns (SC), depressive affect (DA), and anhedonia (AN) were significant (*p's* < 0.001), indicating an acceptable measurement model.

In model 1, achievement goal orientation was used as the predictor variable, depression as the outcome variable, and the perceived stressor (PS) and stress-related cognition (SRC) as the mediating variables to build the SEM using Mplus software. The structural model contains of direct paths from achievement goal orientation to depression and of two mediators between achievement goal orientation and depression. A visual depiction of the model (with DS as the outcome variable) is presented in **Figure 2**. Results (**Figure 2**) showed that the standardized path coefficients from mastery-approach (MAP) to perceived stressors (PS), performance-approach (PAP) to PS, performance-avoidance (PAV) to PS, MAP to stress-related cognition (SRC), PAP to SRC, mastery-avoidance (MAV) to SRC, performance-avoidance (PAV) to SRC, PAV to depressive symptom (DS), PS to DS, and SRC to DS were all significant, while MAP to DS, PAP to DS, and MAV to DS were non-significant.

The alternative model (Model 2) examined stress variables function as predictors and the four types of achievement goal orientation as the mediation variables. Comparing the two models, the model 2 showed a same fit to the Model 1 (**Table 5**). The two models are equivalent models. Comparing the two model indicators, we can't rule out any model. However, form the theoretical perspective of cognitive theory of stress, goal-orientation approach act as dispositional traits affect the process from stimulus (stress) to response (emotion and/or behavior) (detailed illustration refers to discussion section). So, we retained Model 1 as the final model of the study.

Mediation Analysis of Depression on Goal Orientation

Mediation tests were conducted by using a 1,000 bootstrapped procedure to compute 95% confidence intervals (CI). If the 95% CI for the indirect effect estimate does not include zero, it is presumed that the indirect effect is statistically significant at the 0.05 level (Shrout and Bolger, 2002; Tian et al., 2017). As shown in **Figure 3A**, a significant indirect path from mastery-avoidance (MAP) to depressive symptom (DS) was mediated by perceived stressors (PS) ($\beta = -0.08$, 95% CI [−0.14, −0.031]; $p = 0.003$), which accounted for 31.37% of the total effect, suggesting a buffering effect from MAP to DS. A significant indirect path

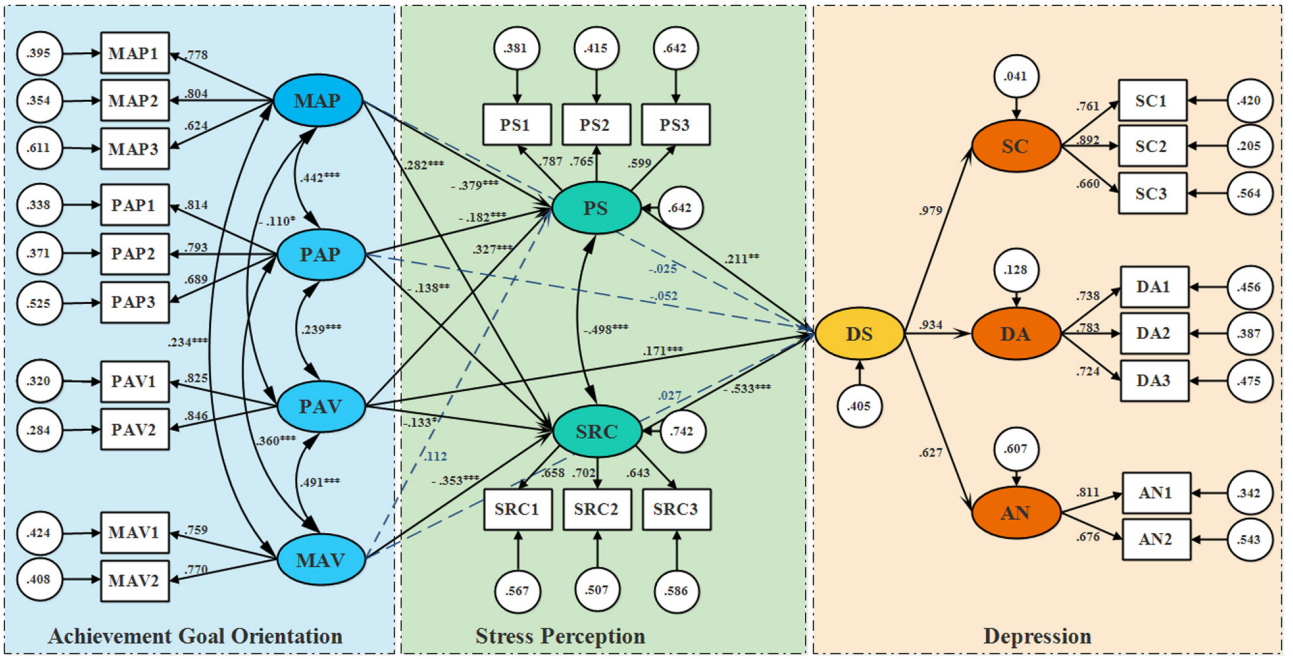

FIGURE 2 | Structural model with path coefficients. Note: MAP = Mastery-approach, MAV = Mastery-avoidance, PAP = Performance-approach, PAV = Performance-avoidance, PS = perceived stressors, SRC = Stress related cognition, DS = Depressive symptoms, SC = Somatic concerns, DA = Depressive affect, AN = Anhedonia. The path coefficients are standardized. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

from MAP to DS was mediated by stress-related cognition (SRC) (β = −0.15, 95% CI [−0.222, −0.091]; $p < 0.001$), which constituted 58.52% of the total effect, suggesting a buffering effect from MAP to DS. A significant indirect path from performance-approach (PAP) to DS was mediated by PS (β = −0.038, 95% CI [−0.076, −0.015]; $p = 0.016$), and a significant indirect path from PAP to DS was mediated by SRC (β = 0.074, 95% CI [0.013, 0.133]; $p = 0.013$), suggesting a facilitating effect from PAP to DS. A significant indirect path from mastery-avoidance (MAV) to DS was mediated by SRC (β = 0.188, 95% CI [0.122, 0.271]; $p < 0.001$), suggesting a facilitating effect from MAV to DS. A significant indirect path from performance-avoidance (PAV) to DS was mediated by PS (β = 0.069, 95% CI [0.028, 0.131]; $p = 0.007$), which constituted 22.19% of the total effect and a significant indirect path from PAV to DS was mediated by SRC (β = 0.071, 95% CI [0.011, 0.136]; $p = 0.025$), which constituted 22.83% of the total effect, suggesting a facilitating effect from PAP to DS. The results of observed total, direct, and indirect effect from MAP, PAP, MAV, and MPV to SC, DA, and AN are showed in **Figures 3B–D** respectively.

DISCUSSION

The primary findings of the current study are threefold. First, mastery-approach (MAP) orientation may offered a protective effect on depression via the mediating role of stress perception. Second, performance-avoidance goal orientation and the perceived stressor both showed direct facilitative effects on depression, whereas stress-related cognition showed direct protective effects on depression. Third, both the perceived stressor and stress related cognition may mediate the effects of goal orientation on depression.

The current research replicated and extended previous findings in various ways. To the best of our knowledge, this is the first study in medical students' setting that incorporated mental health (i.e., depression, including depressive symptoms and the three sub-factors including somatic concerns, depressive affect, and anhedonia) and related it to achievement goal orientation and stress perception (both perceived stress and stress-related cognition). In line with our expectations (Hypothesis 3), the perceived stressor is positively related to depression and appears to have direct facilitative effects on depression. Indeed, a substantial body of research has established a robust and causal association between stressful life events and depression (Hammen, 2005). The current finding is surprising given the numerous studies exploring the relationship between perceived stressors and mental health that exist, yet there is a dearth of research examining the relationship between an individual's perception (stress-related cognition) that stress affects their health, health outcomes, and from whom to seek help to reduce stress (Keller et al., 2012). In the current study, stress-related cognition was negatively related to depression and appeared to have direct protective effects on depression, suggesting the importance of improved stress-related cognition for optimal psychological functioning. Specifically, better stress-related cognition in the current study suggests that insight into stress perception, taking stress as a positive motivator,

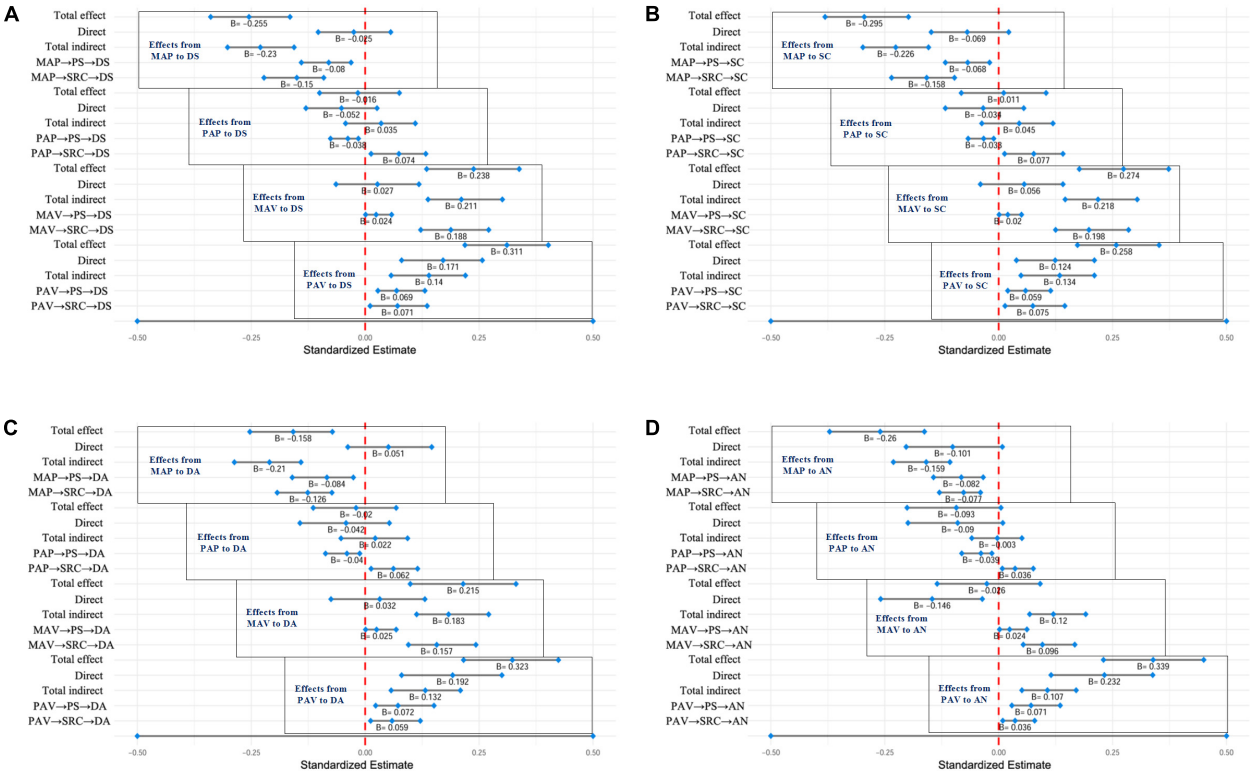

FIGURE 3 | Standardized estimates of total, direct, total indirect, and specific indirect effects. **(A)** Effects from MAP, PAP, MAV, or PAV to DS; **(B)** Effects from MAP, PAP, MAV, or PAV to SC; **(C)** Effects from MAP, PAP, MAV, or PAV to DA; **(D)** Effects from MAP, PAP, MAV, or PAV to AN. If zero is not in the 95% CI, it is presumed that the effect is statistically significant at the 0.05 level.

and relying on people close to the individual for support and helpful advice.

It should be noted that the findings on mastery-approach (MAP) goal orientation reported here did not provide support for a direct effect on depression, however, the results of the mediating effects of the perceived stressor and stress-related cognition were consistent with our expectations that MAP goal orientation offered a protective effect on depression in Chinese medical students (Hypothesis 1 and Hypothesis 4). Specifically, students with MAP goal orientation were inclined to perceived less stress, suggesting that MAP goal orientation may optimize stress as a perceived stressor by offering the advantage of providing additional information relevant to how to improve (Tuominen-Soini et al., 2008). People who use this type of goal orientation also tend to have good insight on stress perception, taking stress as a positive motivator, and relying on those closest to them for support and helpful advice, which may provide for improved mental health. Contrarily, students with mastery-avoidance (MAV) goal orientation appeared to have facilitative effects on depression and those effects were primarily mediated by stress-related cognition. In line with the definitions, mastery goal orientation tends to focus on the improvement of ability, in which MAP goal orientation implies a focus on improvement of one's competence and gaining mastery over a task, while MAV goal orientation implies the focus is on avoiding incompetency and preventing the loss of mastery over a task. People with MAP goal orientation tend to conceptualize ability as a malleable construct that can be improved through greater effort (Elliot, 1999; Vandewalle et al., 2019). People with MAV goal orientation, however, tend to view that once one's competencies are up to par, they will not deteriorate and often have a low perceived stress. However, this type of orientation is plausibly less adaptive in an educational setting, where the focus is on further developing one's competencies.

Moreover, there was no direct effect on depression in students with performance-approach (PAP) goal orientation. The current results suggest that this relationship was the weakest in the model. The total mediation effects of the perceived stressor and stress-related cognition from PAP to depression were canceled out; the perceived stressor mediated the obstructive effects on depression, while stress-related cognition mediated the facilitative effects on depression. This effect was not consistent with the general supposition that PAP goal orientation is considered to be more likely be related to the perceived stressor. One possible explanation for the absence of a relationship between PAP goal orientation and the perceived stressor is that the students who utilized a performance approach may have higher self-efficacy, which may aid with the coping of stress. As previously discussed, PAP goals (demonstrating ability and outperforming others) are positively related to persistence and achievement

outcomes, particularly in college students (Harackiewicz et al., 2002). Contrarily, students with performance-avoidance (PAV) goal orientation demonstrated a more direct facilitative effect on depression (in line with our expectations of Hypothesis 2) and a minute facilitative mediation effect both from perceived stressor and stress-related cognition on depression. As previous studies reveal that PAV goal orientation primarily produces adverse effects, e.g., negative cognitions, anxiety, depression, self-concerns, and distraction (Sideridis, 2007). It should be noted that, although students with performance goal orientation (both PAP and PAV) may have good insight into stress perception, taking stress as a positive motivator and relying on those close to them for support and helpful advice, those with PAP goal orientation tend to focus on showing one's competence and gaining positive judgments from others, while students with PAV goal orientation focuses on avoiding any display of incompetence and preventing unfavorable judgments from others, which could prevent them from getting real psychological support.

Though many equivalent models can fit the data equally well, equivalent models cannot be distinguished in statistical ways (Raykov and Marcoulides, 2007). Exploration of relationships among variables without *a priori* specification may result in statistical significance but have little theoretical significance. In our study, we rule out equivalent Model 2 mainly based on the theoretical guidance of cognitive stress theory. There are three phases to this theory (Folkman and Lazarus, 1986). First, primary appraisal includes the process of identifying whether the stress poses a threat to the individual (Lazarus and Richard, 1966). In the primary appraisal process there are two factors that affect whether the individual defines the stress as a threat to himself or herself; one is the stimulus structural factor, such as the urgency of the expected injury or the ambiguity of the stimulus cues, while the other is the individual psychological structural factor (personality trait) (Lazarus and Richard, 1966; Hoyt et al., 2016), such as motivational characteristics, the belief systems about the environment, intellectual resources, educational level, etc., Next is the secondary appraisal. Once a stimulus is determined to be threatening, the individual will mentally consider an appropriate response to the stressor in order to reduce the anticipated harm. This process is influenced by three factors; the degree of the threat, the stimulus structure, and the psychological structure of the individual, including motivation type, self-resources, defensive characteristics, and belief in environment and personal resources. Third is coping, the process by which a secondary assessment is made to determine the response strategy that should be adopted and implemented. Coping strategies can include direct action, defensive re-evaluation, or an anxiety response. Goal-orientation approach as the motivational characteristics may affect the first and second process of response formation. They act as dispositional traits affect the process from stimulus (stress) to response (emotion and/or behavior).

The exploratory factor analysis results for CES-D from the current study were similar to previous studies (Jiang et al., 2019). It seems that the Chinese students may have an overlap of understanding between depressed affect and somatic concerns. Considerable studies have demonstrated that the Chinese tend to express somatization of depression, whereas Westerners tend to express the psychological symptoms of depression (Cheung and Bagley, 1998; Ryder et al., 2008). The current study showed a 26.3% prevalence of depression, which was similar to a previous meta-analysis (Puthran et al., 2016). Overall, the current study shows no significant gender difference in depression, although some research has demonstrated a higher depression rate in female students (Lloyd and Gartrell, 1984; Dyrbye et al., 2006), numerous studies found no gender difference in depression proportions at the start of medical school, but greater increases in female students through the course of training (Chen et al., 2013; Gao et al., 2020). Ethnicity information also revealed a similar depression rate among minority students and Chinese Han students, consistent with a previous study (Chen et al., 2013). Unexpectedly, students with a single-parent family showed a higher perceived stress but a similar depression rate compared with students with a two-parent family. Previous studies have shown that non-intact families generally had higher risk of mental health issues such as depression, suicidal ideation, and poor perceived health status than two-parent families (Park and Lee, 2020). One explanation for the different results is that perhaps medical students are already excellent and students who have psychological problems due to family status may have been excluded from admission to medical school. Furthermore, student cadres had lower depression rates than non-cadre students. The student cadres are the leaders of the students and are generally excellent students, have better communication skills, and overall more positive personalities, which can enhance their mental health. Typically, students with government accredited poverty families had higher depression rates than non-government accredited poverty families (Shamsuddin et al., 2013; Chan and Sun, 2020), although there was no significant difference in income on depression, perhaps because college students may not clearly know their family income, but do clearly know whether their family was a government accredited poverty family, as this status would provide eligibility for special scholarships and policy care in Chinese universities. The current study suggests possible important academic performance differences in the prediction of risk to medicals students' depression. Specifically, students with good academic performance had lower depression rates than those with poor academic performance. For medical students, perhaps, depressive feelings of academic disappointment may be more prevalent among those who have poor academic performance, as failure in academic tasks is almost as frequent as the number of exams and evaluations in which they participate (Stewart et al., 1999; Yusoff et al., 2013).

Given the methodological limitations of the present study, there are some limitations in this study. First, this research is cross-sectional in nature and therefore makes it difficult to rule out other orders of pathways. This research represents an exploratory stage, so the next logical step is to conduct laboratory experimental researches or use longitudinal study design to properly examine the causality among those variables. Second, future research should explore key individual variables that influence the direction of stress perception, such as self-esteem or other personality traits, to better understand the development of depression in medical students. Third, more

attention should be paid to the contextual factors, such as the classroom learning climate, that influence the achievement goal orientation of medical students. Finally, inferences should be derived with caution from the current research, as the effect size is variable and some effects are small. The second year students have more stable goal orientation, and they are not busy with clinical clerkship.

In summary, the current results highlight the important links between goal characteristics and their facilitative and obstructive effects on depression via the perceived stressor and stress-related cognition. The empirical findings spark a more holistic perspective on the application of motivational intervene that assist students in adopting mastery-approaching strategy as well as ways of coping with stressful academic situations. Identifying students with achievement goal orientation and providing them with the appropriate supportive services may help them to manage stress and mitigate or prevent depression.

DATA AVAILABILITY STATEMENT

The dataset supporting the conclusions of this article is included within its additional files (**Supplementary Dataset**).

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Human Research Ethics Committee of China Medical University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

LL, HL, ND, and DW substantially contributed to the conception and design of the research. LL contributed to data acquisition. YW analyzed the data, interpreted the results, and prepared the initial draft of the manuscript. ND critically reviewed the manuscript and gave advice for modifications. HL, ND, and DW worked for the final approval of the version of the manuscript to be published. All authors contributed to the article and approved the submitted version.

FUNDING

This work was supported by the Medical Education Project of Chinese Medical Association (2018A-N03038), China Medical University "the 13th Five-Year" the First Batch of Medical Education Key Projects, No. 3 and China Medical University "the 13th Five-Year" the First Batch of Medical Education Projects (Grant Number YDJK2016002).

ACKNOWLEDGMENTS

We would like to thank all the participants in this study. We also thank Nan Jiang and BioMed Proofreading for their valuable services in language editing.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.614787/full#supplementary-material

REFERENCES

Baumann, N., Kaschel, R., and Kuhl, J. (2005). Striving for unwanted goals: stress-dependent discrepancies between explicit and implicit achievement motives reduce subjective well-being and increase psychosomatic symptoms. *J. Personal. Soc. Psychol.* 89, 781–799. doi: 10.1037/0022-3514.89.5.781

Chan, H. W. Q., and Sun, C. F. R. (2020). Irrational beliefs, depression, anxiety, and stress among university students in Hong Kong. *J. Am. Coll Health* 2020, 1–15. doi: 10.1080/07448481.2019.1710516

Chen, L., Wang, L., Qiu, X. H., Yang, X. X., Qiao, Z. X., Yang, Y. J., et al. (2013). Depression among Chinese University Students: Prevalence and Socio-Demographic Correlates. *PLoS One* 8:e58379. doi: 10.1371/journal.pone.0058379

Cheung, C.-K., and Bagley, C. (1998). Validating an American scale in Hong Kong: the Center for Epidemiological Studies Depression Scale (CES-D). *J. Psychol.* 132, 169–186. doi: 10.1080/00223989809599157

Cohen, S., Tom, K., and Robin, M. (1983). A Global Measure of Perceived Stress. *J. Health Soc. Behav.* 24, 385–396.

Diener, C. I., and Dweck, C. S. (1978). An analysis of learned helplessness: Continuous changes in performance, strategy, and achievement cognitions following failure. *J. Personal. Soc. Psychol.* 36, 451–446.

Dyrbye, L. N., Thomas, M. R., and Shanafelt, T. D. (2006). Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad. Med.* 81, 354–373. doi: 10.1097/00001888-200604000-00009

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educ. Psychol.* 34, 169–189. doi: 10.1207/s15326985ep3403_3

Folkman, S., and Lazarus, R. S. (1986). Stress-processes and depressive symptomatology. *J. Abnorm. Psychol.* 95, 107–113. doi: 10.1037//0021-843x.95.2.107

Gao, W., Ping, S., and Liu, X. (2020). Gender differences in depression, anxiety, and stress among college students: A longitudinal study from China. *J. Affect Disord* 263, 292–300. doi: 10.1016/j.jad.2019.11.121

Hammen, C. (2005). Stress and depression. *Annu. Rev. Clin. Psychol.* 1, 293–319. doi: 10.1146/annurev.clinpsy.1.102803.143938

Harackiewicz, J. M., Barron, K. E., Pintrich, P. R., Elliot, A. J., and Thrash, T. M. (2002). Revision of achievement goal theory: Necessary and illuminating. *J. Educ. Psychol.* 94, 638–645.

Holmes, T. H., and Rahe, R. H. (1967). The social readjustment rating scale. *J. Psychosom. Res.* 11, 213–218.

Hope, V., and Henderson, M. (2014). Medical student depression, anxiety and distress outside North America: a systematic review. *Med. Educ.* 48, 963–979. doi: 10.1111/medu.12512

Hoyt, M. A., Austenfeld, J., and Stanton, A. L. (2016). Processing coping methods in expressive essays about stressful experiences: Predictors of health benefit. *J. Health Psychol.* 21, 1183–1193. doi: 10.1177/1359105314550347

Hu, Lt, and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. Multidisciplinar. J.* 6, 1–55. doi: 10.1080/10705519909540118

Jiang, H., Li, S., and Yang, J. (2018). Work Stress and Depressive Symptoms in Fishermen With a Smoking Habit: A Mediator Role of Nicotine Dependence

and Possible Moderator Role of Expressive Suppression and Cognitive Reappraisal. *Front. Psychol.* 9:386–397. doi: 10.3389/fpsyg.2018.00386

Jiang, L., Wang, Y., Zhang, Y., Li, R., Wu, H., Li, C., et al. (2019). The Reliability and Validity of the Center for Epidemiologic Studies Depression Scale (CES-D) for Chinese University Students. *Front. Psychiatr.* 10:315–326. doi: 10.3389/fpsyt.2019.00315

Keller, A., Litzelman, K., Wisk, L. E., Maddox, T., Cheng, E. R., Creswell, P. D., et al. (2012). Does the perception that stress affects health matter? The association with health and mortality. *Health Psychol.* 31, 677–684. doi: 10.1037/a0026743

Krys, S., Otte, K.-P., and Knipfer, K. (2020). Academic performance: A longitudinal study on the role of goal-directed rumination and psychological distress. *Anx. Stress Cop.* 2020, 1–15. doi: 10.1080/10615806.2020.1763141

Lazarus, and Richard, S. (1966). Story telling and the measurement of motivation: the direct versus substitutive controversy. *J. Consult. Psychol.* 30, 483–487.

Ling, Y., He, Y., Wei, Y., Cen, W., Zhou, Q., and Zhong, M. (2016). Intrinsic and extrinsic goals as moderators of stress and depressive symptoms in Chinese undergraduate students: A multi-wave longitudinal study. *BMC Psychiatr.* 16:138–145. doi: 10.1186/s12888-016-0842-5

Liu, H., and Guo, D. (2003). A research of the relationship between pretest anxiety, achievement goal orientation and test performance (in Chinese). *Psychol. Dev. Educ.* 19, 64–68.

Lloyd, C., and Gartrell, N. K. (1984). Psychiatric symptoms in medical students. *Comprehen. Psychiatr.* 25, 552–565. doi: 10.1016/0010-440x(84)90036-1

Meece, J. L., Anderman, E. M., and Anderman, L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annu. Rev. Psychol.* 57, 487–503. doi: 10.1146/annurev.psych.56.091103.070258

Ntoumanis, Nikos, Vazou, and Spiridoula. (2005). Peer Motivational Climate in Youth Sport: Measurement Development and Validation. *J. Sport Exercise Psy.* 27, 432–455. doi: 10.1123/jsep.27.4.432

Park, H., and Lee, K.-S. (2020). The association of family structure with health behavior, mental health, and perceived academic achievement among adolescents: a 2018 Korean nationally representative survey. *BMC Public Health* 20:08655–z. doi: 10.1186/s12889-020-08655-z

Puthran, R., Zhang, M. W., Tam, W. W., and Ho, R. C. (2016). Prevalence of depression amongst medical students: a meta-analysis. *Med. Educ.* 50, 456–468. doi: 10.1111/medu.12962

Radloff, L. S. (1977). The CES-D Scale A Self-Report Depression Scale for Research in the General Population. *Appl. Psychol. Measure.* 1, 385–401.

Raykov, T., and Marcoulides, A. G. (2007). Equivalent Structural Equation Models: A Challenge and Responsibility. *Struct. Equ. Model.* 14, 695–700. doi: 10.1080/10705510701303798

Rotenstein, L. S., Ramos, M. A., Torre, M., Segal, J. B., Peluso, M. J., Guille, C., et al. (2016). Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis. *JAMA* 316, 2214–2236. doi: 10.1001/jama.2016.17324

Rothbaum, F., Morling, B., and Rusk, N. (2009). How Goals and Beliefs Lead People into and Out of Depression. *Rev. Gen. Psychol.* 13, 302–314. doi: 10.1037/a0017140

Ryder, A. G., Yang, J., Zhu, X., Yao, S., Yi, J., Heine, S. J., et al. (2008). The cultural shaping of depression: somatic symptoms in China, psychological symptoms in North America? *J. Abnorm. Psychol.* 117, 300–313. doi: 10.1037/0021-843X.117.2.300

Ryu, E. (2011). Effects of skewness and kurtosis on normal-theory based maximum likelihood test statistic in multilevel structural equation modeling. *Behav. Res. Methods* 43, 1066–1074.

Shamsuddin, K., Fadzil, F., Ismail, W. S., Shah, S. A., Omar, K., Muhammad, N. A., et al. (2013). Correlates of depression, anxiety and stress among Malaysian university students. *Asian J. Psychiatr.* 6, 318–323. doi: 10.1016/j.ajp.2013.01.014

Shen, Y., Zhang, Y., Chan, B. S. M., Meng, F., Yang, T., Luo, X., et al. (2020). Association of ADHD symptoms, depression and suicidal behaviors with anxiety in Chinese medical college students. *BMC Psychiatr.* 20:180. doi: 10.1186/s12888-020-02555-7

Shrout, P. E., and Bolger, N. (2002). Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychol. Methods* 7, 422–445. doi: 10.1037/1082-989X.7.4.422

Sideridis, G. D. (2007). Why are students with LD depressed? A goal orientation model of depression vulnerability. *J. Learn. Disab.* 40, 526–539. doi: 10.1177/00222194070400060401

Steiner-Hofbauer, V., and Holzinger, A. (2020). How to Cope with the Challenges of Medical Education? Stress, Depression, and Coping in Undergraduate Medical Students. *Acad. Psychiatr.* 44, 380–387. doi: 10.1007/s40596-020-01193-1

Stewart, S. M., Lam, T. H., Betson, C. L., Wong, C. M., and Wong, A. M. (1999). A prospective analysis of stress and academic performance in the first two years of medical school. *Med. Educ.* 33, 243–250. doi: 10.1046/j.1365-2923.1999.00294.x

Street, H. (2002). Exploring Relationships Between Goal Setting, Goal Pursuit and Depression: A Review. *Austr. Psychol.* 37, 95–103. doi: 10.1080/00050060210001706736

Tian, L., Yu, T., and Huebner, E. S. (2017). Achievement Goal Orientations and Adolescents' Subjective Well-Being in School: The Mediating Roles of Academic Social Comparison Directions. *Front. Psychol.* 8:37–47. doi: 10.3389/fpsyg.2017.00037

Tuominen-Soini, H., Salmela-Aro, K., and Niemivirta, M. (2008). Achievement goal orientations and subjective well-being: A person-centred analysis. *Learn Instr.* 18, 251–266. doi: 10.1016/j.learninstruc.2007.05.003

Ursin, H., and Eriksen, H. (2007). Cognitive activation theory of stress, sensitization, and common health complaints. *Ann. N. Y. Acad. Sci.* 1113, 304–310. doi: 10.1196/annals.1391.024

Valle, A., Cabanach, R. G., Nunez, J. C., Gonzalez-Pienda, J., Rodriguez, S., and Pineiro, I. (2003). Multiple goals, motivation and academic learning. *Br. J. Educ. Psychol.* 73(Pt 1), 71–87. doi: 10.1348/000709903762869923

van Dam, A., Noordzij, G., and Born, M. (2020). Thriving Under Uncertainty: The Effect of Achievement Goal Orientation on Job Insecurity and Flourishing. *Soc. Indic. Res.* 3, 2337–2334. doi: 10.1007/s11205-020-02337-4

Vandewalle, D., Nerstad, C. G. L., and Dysvik, A. (2019). Goal Orientation: A Review of the Miles Traveled and the Miles to Go. *Annu. Rev. Organ. Psych.* 6, 115–144. doi: 10.1146/annurev-orgpsych-041015-062547

Vergara, C., and Roberts, J. E. (2011). Motivation and goal orientation in vulnerability to depression. *Cogn. Emot.* 25, 1281–1290. doi: 10.1080/02699931.2010.542743

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychol. Rev.* 92, 548–573. doi: 10.1037/0033-295X.92.4.548

Wooley, S. C., Blackwell, B., and Winget, C. (1978). A learning theory model of chronic illness behavior: theory, treatment, and research. *Psychosom. Med.* 40, 379–401. doi: 10.1097/00006842-197808000-00003

Yang, Q., Tian, L., Huebner, E. S., and Zhu, X. (2019). Relations among academic achievement, self-esteem, and subjective well-being in school among elementary school students: A longitudinal mediation model. *Sch. Psychol.* 34, 328–340. doi: 10.1037/spq0000292

Yusoff, M. S., Abdul Rahim, A. F., Baba, A. A., Ismail, S. B., Mat, Pa, M. N., et al. (2013). Prevalence and associated factors of stress, anxiety and depression among prospective medical students. *Asian J. Psychiatr.* 6, 128–133. doi: 10.1016/j.ajp.2012.09.012

Zhang, J., Wu, Z., Fang, G., Li, J., Han, B.-X., and Chen, Z.-Y. (2010). Development of the Chinese age norms of CES-D in urban area (in Chinese). *Chin. Ment. Health J.* 24, 139–143. doi: 10.3969/j.issn.1000-6729.2010.02.015

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

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 05 March 2021
doi: 10.3389/fpsyt.2021.649090

Delivering Difficult News: Simulation-Enhanced Training Improves Psychiatry Residents' Clinical Communication Skills

Doron Amsalem[1,2]*, *Andrés Martin*[3,4], *Mariela Mosheva*[2,4,5], *Omer Soul*[2,4,5], *Liran Korotkin*[4], *Amitai Ziv*[2,4,6], *Doron Gothelf*[5,7] *and Raz Gross*[2,4,8]

[1] New York State Psychiatric Institute and Department of Psychiatry, Columbia University Vagelos College of Physicians & Surgeons, New York, NY, United States, [2] MSR–Israel Center for Medical Simulation, Sheba Medical Center, Ramat Gan, Israel, [3] Child Study Center, Yale School of Medicine, New Haven, CT, United States, [4] Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, [5] Division of Child & Adolescent Psychiatry, Sheba Medical Center, Edmond and Lily Safra Children's Hospital, Ramat Gan, Israel, [6] Sheba Medical Center, Integrated Rehabilitation Hospital, Ramat Gan, Israel, [7] Faculty of Medicine, Sagol School of Neuroscience, Tel Aviv University, Tel Aviv, Israel, [8] Division of Psychiatry, Sheba Medical Center, Ramat Gan, Israel

OPEN ACCESS

Edited by:
Armida Mucci, University of Campania Luigi Vanvitelli, Italy

Reviewed by:
Stefano Barlati, University of Brescia, Italy
Giacomo Deste, Civil Hospital of Brescia, Italy

***Correspondence:**
Doron Amsalem
doron.amsalem@gmail.com

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *03 January 2021*
Accepted: *10 February 2021*
Published: *05 March 2021*

Citation:
Amsalem D, Martin A, Mosheva M, Soul O, Korotkin L, Ziv A, Gothelf D and Gross R (2021) Delivering Difficult News: Simulation-Enhanced Training Improves Psychiatry Residents' Clinical Communication Skills. Front. Psychiatry 12:649090. doi: 10.3389/fpsyt.2021.649090

Background: Delivering difficult news to individuals diagnosed with mental health disorders and their family members can be challenging. The use of simulated patients (SP) is an effective teaching method to enhance clinical skills, particularly those around communication. We developed, implemented, and evaluated the effectiveness of an SP-based training module to improve psychiatric residents' clinical communication skills in delivering difficult news.

Methods: We conducted 5-h workshops consisting of 3 components: (1) a high-fidelity simulation session with a professional actor; (2) a 30-min lecture; and (3) role-playing of 3 short scenarios, during which residents rotated taking on different roles (as psychiatrist, patient, or family member). We observed through a 1-way mirror and videotaped each resident's simulation session and followed it with personalized debriefing. Following the workshop, each resident received the full-length video of their simulated interview, together with a list of questions as a take-home assignment. Two months after the workshop, the residents were invited to a second SP-based session, during which 2 independent evaluators, each a board-certified psychiatrist with expertise in medical simulation, evaluated the participants' communication skills using a previously validated instrument. To avoid observation bias, the 2 evaluators rated the videotapes blind to the timing of the simulation (pre- vs. post-training). Participants completed self-report questionnaires on satisfaction and self-confidence, before, after, and 2 months following the workshop.

Findings: Of the 28 psychiatric residents who participated in the training day, 24 (86%) completed the post-workshop evaluation. Mean communication score increased from 24.9 to 27.8 (paired t-test: 5.6, $p < 0.001$). The mean score for the self-confidence questionnaire, calculated on a 1 to 5 Likert scale, increased from 3.4 to 4.0 after the training day, and remained unchanged (4.2) 2 months later ($p < 0.001$).

Conclusions: An SP-based training module proved useful in improving the objectively measured communication skills of psychiatric residents delivering difficult news. The training further enhanced participants' subjective sense of confidence in those clinical skills.

Keywords: simulation, residents, medical education, delivering difficult news, psychiatry

INTRODUCTION

In psychiatry, sharing diagnoses and other difficult information can be particularly challenging (1). A review of the literature shows that many psychiatrists withhold information due to various reasons (2–4). They assume patients may have restricted ability for information processing due to the nature of psychiatric symptoms, which, by their perspective, can interfere with cognitive and emotional functions as reality testing, lack of insight, and emotional regulation (5). In other studies, mental health providers reported fears about delivering an incorrect diagnosis, the patient's distress, and the stigmatizing impact of using words such as "schizophrenia" (4, 6, 7). Patients and their relatives have expressed dissatisfaction with the way diagnostic and other sensitive information was shared with them (8), and several studies have demonstrated that individuals diagnosed with mental health disorders and their relatives want to be fully informed–and should (9, 10). In sum, there is a need for clear guidelines and proper education to reduce the discomfort and uncertainty associated with sharing difficult information with individuals diagnosed with mental health disorders. In the absence of proper resources and training, psychiatrists may avoid addressing such sensitive content altogether.

Several protocols have been developed to facilitate this complicated process of information disclosure, including the SPIKES (11), and Girgis and Sanson-Fischer (12) protocols. These protocols consistently present similar principles: emotional support; what and how much information to provide; manner of communicating news; and setting (13). A study among 1,337 individuals with life-changing diagnoses showed that the SPIKES protocol largely reflects patients' preferences (14). This study found 83% of the surveyed medical schools in Canada reported using the SPIKES to teach how to disclose difficult news.

The SPIKES (11) protocol includes 6 steps: (1) *Setting* up the environment; (2) assessing the patient's *Perception* of his/her condition; (3) *Inviting* the patient to define which information he/she would like to receive; (4) providing the required *Knowledge* to the patient; (5) addressing the patient's *Emotions* with empathic responses; and (6) providing a *Summary* of treatment options and future plans. SPIKES was originally used in oncology but gradually shifted to other fields of medicine, including infectious diseases, gynecology, neurology, and ophthalmology (11, 15–18). Previous studies have identified the absence of specific guidelines for sharing difficult news in psychiatry (19) and showed the need for such protocols (20), yet the SPIKES model has not yet been empirically studied in psychiatry (21).

Delivering the diagnosis of a serious illness is an important skill in all fields of medicine, and residents consistently identify a desire and need for further education (22–24). Among various training approaches, the use of simulated patients (SPs) offers numerous advantages in medical education, which have been well-reviewed in the literature (25–27). Practicing specific skills in a supportive space without risk of harm to patients by someone inexperienced, allows for educators and trainees to focus their attention on the complexities of the skills at hand, such as delivering difficult news (28, 29). However, while SP-based methodology is widely used in medical education, its use in the psychiatric field has emerged only recently (30–32). In psychiatry, as in other fields, assisting residents to acquire skills in delivering diagnosis is pivotal (33, 34). Similar to oncology and palliative care, there are complexities and potential harm that can emerge from poorly shared information, yet in psychiatry, the use of simulation to practice communication skills has been minimally studied.

Most studies on SP-based training in delivering difficult news in medicine have focused on self-efficacy and satisfaction outcomes to address communication skills, providing findings that are solely based on the learner's subjective perceptions (35). There are only a few studies that have attempted to examine objective changes in learner performance through the use of SPs and external evaluators (36–38): a study of 38 residents in family medicine and internal medicine (37); a study of 34 residents in pediatric emergency medicine (38); and a study of 98 residents, mainly in surgery-related specialties (36). However, such an approach is yet to be undertaken in psychiatry.

We developed an SP-based workshop to enhance psychiatric residents' clinical and communication skills in delivering difficult news to patients and their families. We hypothesized that following participation in the workshop, psychiatry residents would improve their abilities to communicate difficult news as demonstrated by measurable increases in: (1) objective performance as assessed by external evaluators, and (2) self-confidence.

MATERIALS AND METHODS

Subjects and Ethics Approval

Participants were psychiatry residents recruited from 3 free-standing psychiatric hospitals and one general hospital. All training sites were located in the center of Israel and academically affiliated with Tel-Aviv University. The Sheba Medical Center Institutional Review Board approved the study (Protocol

#SMC5912-19). All participants signed an informed consent form. The study was conducted between March 2019 and January 2020.

Workshop and Procedure

In partnership with the Israel Center for Medical Simulation (MSR), Tel Aviv University, and Yale School of Medicine, we developed a 5-h workshop designed to teach psychiatry residents how to communicate difficult information to patients or their family members. During the course of the study, we delivered the workshop 5 times, with a maximum of 6 psychiatric residents each time, in order to provide each participant with the opportunity to interact with an SP. For consistency, the same SPs attended all the workshops and played the same role each time. The workshop consisted of 3 components: (1) *High-fidelity simulation:* each participant had a 15-min interaction with an SP depicting one of two scenarios described below, followed by a small-group debriefing session. Video cameras recorded the encounters for further analysis, feedback, and reflection in the debriefing sessions. Each participant encountered one SP and then observed other participants through a 1-way mirror. Debriefings were led by two psychiatrists (DA and RG) with expertise in video-based debriefing, who highlighted core elements of delivering difficult news and communication skills. All participants were encouraged to reflect and share their feelings and thoughts, and to make suggestions for improvement; (2) *SPIKES protocol:* a 60-min presentation focusing on aspects unique to psychiatry. The SPIKES tool was chosen following a literature review because of its wide use, simplicity, and applicability for delivering difficult information to patients and their relatives (11, 39). Participants were invited to discuss their own issues and concerns regarding the delivery of difficult information; and (3) *Role-playing:* a 90-min session with 3 short scenarios, during each of which 2 residents rotated taking on different roles (as psychiatrist, patient, or family member). At the end of the training day, each resident received the full-length video of their simulated interview, together with a list of questions as a take-home assignment. Two months after the training day, each resident was invited to a second videotaped SP-based session.

Scenarios

We created two scenarios for SPs, each based on different psychiatric vignettes of a patient and a family member. The first scenario describes a discussion with the mother of an 18-year-old patient recently admitted to a locked inpatient unit due to a first psychotic episode. The second scenario describes a hospitalized patient with bipolar disorder being recommended long-term use of lithium.

Scenarios for role plays included 3 different discussions between a psychiatrist and a patient or family member. For each scenario, we provided 2 summary cards: one for the resident who role played the psychiatrist, another for the one who played the patient or family member. During each conversation, the practicing residents rotated between roles to experience the entire spectrum of the interaction. The first scenario describes a mother being given an autism diagnosis for her 3-year-old son. The second scenario describes a 36-year-old woman with schizoaffective disorder who during an outpatient visit updates her psychiatrist on her efforts to conceive, while on treatment with valproate, a potentially teratogenic medication. The third scenario describes a 43-year-old man diagnosed with bipolar disorder being informed that his driver's license will be suspended following a recent psychotic episode.

Evaluation

Two independent evaluators (MM and OS), each a board-certified psychiatrist with expertise in medical simulation, evaluated the participants' communication skills. To avoid observation bias, the 2 evaluators rated the videotapes blind to the timing of the simulation (pre-workshop vs. two-month post-workshop). The communication tool was developed by Kurtz et al. (40) and was previously used (41) to evaluate residents' communications skills. The communication tool is based on the SPIKES protocol and includes 17 items, such as "Introduces themselves and their roles" to examine the *Setting* step, or "Assesses the patient's starting point" to assess the *Perception* step. Response options were: 0 = "not done or inadequate," 1 = "adequate," and 2 = "good." The scale's Cronbach's alpha was 0.93 for this study; inter-rater agreement was moderate (kappa = 0.58, $p < 0.001$).

Participants completed self-report questionnaires on their confidence in delivering difficult news before, after, and 2 months following the workshop. The questionnaire was previously used by Tobler et al. (41) and included 13 items such as "I feel confident in my ability to listen to patients' concerns," or "I feel confident in my ability to summarize information in a way that is easy to understand." Response choices ranged from 1 ("strongly disagree") to 5 ("strongly agree") on a Likert scale. The questionnaire was translated into Hebrew and then back-translated to English by 2 bilingual authors (DA and LK). The 2 translators and a third author (DG) discussed and resolved discrepancies in the translation. The scale's Cronbach alpha for this study was 0.81. In addition, a 6-item questionnaire was used to measure the participant's self-efficacy and satisfaction at the end of the workshop. Response choices ranged from 1 ("not at all") to 5 ("very much") on a Likert scale. The scale's Cronbach alpha was 0.92 for this study.

Statistical Analysis

We calculated mean scores and standard deviations for each of the questionnaires. We used the *Shapiro Wilk*-test to evaluate for normal distribution. We then used paired *t*-tests to compare change in communication skills mean scores before and 2 months after the workshop. We also used paired *t*-tests to compare change in resident self-assessment mean scores between pre- and post-workshop time points, and between pre- and 2-months post-workshop. We used a two-tailed *p*-value of 0.05 as threshold for significance. We conducted all statistical analyses using IBM SPSS software, version 26.0 (Armonk, NY).

TABLE 1 | Evaluators' scores on communication skills, blinded to the time period (before the workshop and 2 months after).

	Pre-workshop	2 months Post-workshop	Statistic	
SPIKES component/communication skill	**Mean (SD)**	**Mean (SD)**	***t***	***p***
Setting				
Greets the patient and obtains his/her name and use it	1.6 (0.5)	1.8 (0.4)	2.0	NS
Introduces themselves and their role	1.3 (0.7)	1.5 (0.6)	1.3	NS
Explains the nature of the interview	1.0 (0.7)	1.1 (0.5)	0.7	NS
Total score	3.9 (1.3)	4.3 (1.1)	2.2	0.042
Perception				
Assesses the patient's starting point	1.5 (0.7)	1.8 (0.5)	1.8	NS
Makes it clear that serious/important information is to follow	0.8 (0.5)	1.1 (0.7)	1.9	NS
Uses patient's response to guide the next steps in moving forward	1.5 (0.6)	1.8 (0.4)	2.9	0.009
Total score	3.9 (1.6)	4.6 (1.4)	2.5	0.020
Invitation				
Discovers what other information would help them and responds to this	1.2 (0.6)	1.6 (0.5)	2.9	0.008
Knowledge				
Gives explanation in an organized manner using "bite-size pieces"	1.4 (0.5)	1.7 (0.5)	3.1	0.005
Uses clear language and avoids jargon and confusing language	1.6 (0.5)	1.8 (0.4)	2.6	0.017
Total score	3.0 (1.0)	3.4 (0.8)	3.6	0.002
Emotions				
Picks up and responds to patient's non-verbal cues	1.4 (0.6)	1.5 (0.5)	0.4	NS
Allows patient time to react (use of silence), allows for time to think	1.8 (0.4)	1.9 (0.2)	0.9	NS
Encourages patient to contribute reaction, concerns, and feelings and then responds to him/her	1.6 (0.5)	1.7 (0.4)	1.4	NS
Acknowledges patient's concern and feelings as well as values and accepts legitimacy	1.7 (0.4)	1.8 (0.4)	1.1	NS
Uses empathy to communicate appreciation of the patient's feelings or predicament	1.7 (0.5)	1.8 (0.4)	1.5	NS
Demonstrates appropriate non-verbal behavior	1.8 (0.3)	1.8 (0.3)	0	NS
Provides support	1.7 (0.4)	1.7 (0.4)	0.7	NS
Total score	11.6 (2.4)	12.1 (2.3)	1.6	NS
Summary				
Summarizes at the end with a plan to follow up	1.3 (0.4)	1.7 (0.4)	3.6	0.002
Total questionnaire score	24.9 (6.0)	27.8 (5.2)	5.6	<0.001

Paired t-test assessed change pre-workshop to 2-month post-workshop scores (2, good; 1, adequate; 0, not done/inadequate); NS, non-significant.

RESULTS

Sample Characteristics

Our study sample consisted of 28 psychiatric residents (17 females, 11 males) who participated in the study and completed the pre- and post-workshop evaluations, 24 (86%) of whom also completed the two-month post-workshop evaluation. Participants' age distribution was as follows: under 25 ($n = 2$, 7%); 25 to 30 ($n = 11$, 39%); and 30 to 35 ($n = 15$, 54%). Distribution according to years in residency training was as follows: under 2 years ($n = 16$, 57%); more than 2 years ($n = 12$; 43%). Across all time points, independent *t*-tests showed no differences in total mean scores between females and males, or between residents in general or psychiatric hospitals, or between more- and less-experienced residents.

Evaluators' Assessment of the Residents' Performance

In **Table 1** we summarize mean scores for the 17-item communication skills assessment, as rated by the 2 independent evaluators blind to time period (pre- or 2 months post-workshop). Mean scores increased from 24.9 to 27.8 ($t = 5.55$, $p < 0.001$) between pre- and 2-month post-workshop, reflecting improvement in residents' performance. We also found improvement from pre- to 2-month post-workshop in 5 of the 17 items.

Resident Self-Assessment

In **Table 2** we summarize mean scores of residents' self-confidence in their ability to communicate difficult news before, immediately after, and 2-months after the workshop. Mean questionnaire scores increased from 3.6 to 4.0 ($t = 7.3$, $p < 0.001$) between pre- and post-workshop, reflecting an improvement in residents' confidence. Mean scores remained high after 2 months (mean score 4.2, $t = 5.2$, $p < 0.001$), showing an enduring effect for the workshop. Paired *t*-tests also showed significant change between pre- and post-workshop, and between pre- and 2-month post-workshop for 11 (85%) of the 13 questionnaire items. The mean total score for the 6-item self-report satisfaction

TABLE 2 | Residents' self-ratings for confidence in their ability to communicate before, immediately after, and 2 months after the workshop.

	Pre ($n = 28$)	Post ($n = 28$)	F/U ($n = 24$)	Pre to post	Pre to F/U
I feel confident in my ability to…	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	***p***	***p***
Break bad news in general	3.4 (0.9)	4.0 (0.5)	4.2 (0.6)	<0.001	0.003
Create a supportive environment	3.9 (0.7)	4.2 (0.6)	4.4 (0.7)	0.026	0.004
Reduce or eliminate signs that I am nervous or anxious	3.0 (0.7)	3.8 (0.7)	3.9 (0.8)	<0.001	<0.001
Use language that is non-technical and easily understood	4.0 (0.9)	4.4 (0.6)	4.2 (0.9)	0.005	NS
Adjust the rate and amount of information I provide	3.6 (0.7)	4.1 (0.6)	3.9 (0.7)	<0.001	0.095
Listen to patients' concerns	4.2 (0.6)	4.2 (0.6)	4.6 (0.7)	NS	0.030
Explore a patient's expectations	3.6 (0.7)	4.2 (0.6)	4.2 (0.7)	<0.001	0.016
Empathize with a patient	4.2 (0.7)	4.4 (0.6)	4.6 (0.6)	0.057	0.022
Avoid portraying more hope or optimism that I believe exists to deal with the patients' emotions	3.1 (0.9)	4.0 (0.7)	4.1 (0.7)	<0.001	<0.001
Summarize information in a way that is easy to understand	3.6 (0.6)	4.0 (0.8)	4.1 (0.7)	0.017	0.001
Anticipate possible responses by patients	3.3 (0.8)	3.7 (0.7)	3.8 (0.5)	0.003	0.002
Deal with difficult emotions from families	3.3 (0.9)	3.7 (0.7)	4.0 (0.7)	0.005	0.007
Close the conversation in an appropriate way	3.6 (0.8)	4.0 (0.6)	4.3 (0.6)	0.007	<0.001
Mean score	3.6 (0.4)	4.1 (0.4)	4.2 (0.4)	<0.001	<0.001

Paired t-test assessed residents' self-report changes from pre- to post-workshop and pre-workshop to 2-month post-workshop; Items ranged from 1 (strongly disagree) to 5 (strongly agree) on a Likert-type scale; NS, non-significant.

TABLE 3 | Residents' self-efficacy and satisfaction ratings at the end of the workshop.

To what extent do you think…	**Mean**	**SD**
You will use the tools you learned during this day?	4.6	0.6
You would like to have other learning opportunities with SPs in the future?	4.3	0.9
You learned about yourself as a professional?	4.0	0.9
The discussion with the video contributed to your learning?	4.3	0.9
The discussion was fruitful and productive?	4.4	0.8
The workshop was organized logistically/administratively?	4.7	0.6
Mean score	4.4	0.7

Workshop participants rated each of the items on a Likert-type scale from 1 ("not at all") to 5 ("very much").

questionnaire was 4.4 ± 0.7, indicating high satisfaction with the workshop (see **Table 3**).

DISCUSSION

The purpose of this study was to test the efficacy of a 5-h simulation-enhanced workshop in improving psychiatric residents' self-confidence and communication skills sharing difficult news with patients and their family members. As hypothesized, we found an increase in communication skills as evaluated by external evaluators blind to the timing of simulated interactions (before or 2 months after the training). We also found an increase in residents' self-confidence after attending the workshop, a change that endured 2 months later. Our findings strengthen the existing knowledge (42, 43) on the positive effect of SP-based training in psychiatry, and expand it by demonstrating objective and subjective improvements that persist 2 months after training.

Our simulation-enhanced workshop differs from previous efforts in other areas of medicine. Other workshops have focused mainly on "breaking bad news" (28, 37), whereas we attempted to address a wider spectrum of difficult news, as specifically pertinent to psychiatry. In addition to sharing new diagnoses (schizophrenia or autism), the scenarios and role play vignettes we developed included discussions about involuntary hospitalization, the need for chronic medication use, considerations around medication use during pregnancy and, a driver's license suspension due to a psychotic episode.

Unlike other fields in medicine with more discrete diagnostic criteria, sharing diagnoses in psychiatry can be a continuous and iterative process, often requiring more than one session (6). Sharing information about diagnosis of a serious mental illness is particularly challenging, as the nature of mental illness is often difficult to explain, since there may be no clear etiology and treatment options and prognosis may vary widely. In addition, newly diagnosed individuals with mental health disorders often may not accept their diagnosis due to lack of insight, impaired reality testing or cognition, or stigma related to their condition (44). Moreover, diagnostic information is not the only difficult information that a psychiatrist is likely to share with patients or family members. We addressed this variability through a range of different SP scenarios, discussions, and role plays.

Our main finding was a significant increase in the total mean scores of communication skills at two-months follow-up. This finding is in line with a previous study (41) among 39 pediatric residents, which showed a similar effect in improving residents' communication skills. However, and in contrast to that study, we found that even though residents' self-confidence improved across all self-rated domains, blinded evaluators found

no change on items assessing the way the residents addressed the SP's *Emotions*. This finding was inconsistent with other studies showing a change across all SPIKES domains (41, 45). Three possible explanations may address this discrepancy: First, our study assessed a 2-month follow-up interval, compared to an immediate change in other studies. Second, the pre- and post-workshop mean scores were both relatively high for these items, indicating a possible ceiling effect. Third, the lack of change may be attributed to differences between the simulated environment and the residents' daily clinical reality, as some simulated scenarios may not represent the full complexity of real patients.

We have recently described a new model of SP-based learning that can help address the last of these three possibilities. In this model, termed Co-constructive Patient Simulation (CCPS) (46), a designated learner creates a case script based on a challenging encounter faced during clinical practice. Together with an instructor, the learner is then involved in creating, editing, and practicing role play of the simulated case with an SP. After the creation of the simulated environment, fellow learners with no prior knowledge of the case interview the SP. The educational encounter is followed by a group debriefing. We piloted the CCPS model with 11 trainees in child and adolescent psychiatry throughout a full academic year. The topics chosen by the 6 designated learners included: medical errors and error disclosure, racial tensions and overt racism, interprofessional conflicts, transphobia, patient-on-provider violence, and sexual health. The residents, who rated the model highly, shared that they were engaged and could openly discuss emotionally challenging topics. In sum, it seems that for the unique challenges of sharing difficult news in psychiatry, a learner-centered simulation approach may create even more meaningful and relevant learning opportunities.

Limitations

Our study has several limitations. First, lacking a comparison to other teaching methods or a non-training control group, we conducted within-group pre- and post-workshop tests. Consequently, improvement in communication and clinical skills could be attributed in part to other factors, such as site-specific training opportunities, given that residents continued their training and had other psychiatric learning experiences during the 2-month interval between the pre- and post-workshop assessments. Second, our sample consisted of only 24 residents who completed the study, thus limiting generalizability and statistical power. Third, our study included residents in different training years, introducing heterogeneity to the study sample, even though we found no differences in outcomes between more and less experienced residents. Finally, given the small sample size and exploratory nature of our study, we recognize that our item-level findings would have been more modest had we made corrections for multiple comparisons. For example, in the case of **Table 1**, the Bonferroni significance threshold would have been a more conservative 0.0038 (i.e., 0.05/13). Nevertheless, an approach of not adjusting for multiple comparisons is preferable as it leads to fewer errors of interpretation when the data under evaluation are not random numbers but actual observations (47).

CONCLUSIONS

This study presented and evaluated the efficacy of a model for teaching psychiatric residents how to better communicate diagnostic and other difficult information. Participants found the simulation-enriched workshop to be useful and demonstrated objective improvements in their abilities to deliver difficult news. The training further enhanced participants' subjective sense of confidence and competence in those communication skills. Sharing diagnoses and other difficult information in psychiatry is challenging, and future studies should focus on developing and investigating ways to facilitate this clinical process.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Sheba Medical Center Institutional Review Board approved the study (Protocol #SMC5912-19). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

DA and AM developed the study design. DA and LK performed the analytic calculations. MM and OS performed the evaluations. RG supervised the project. All authors contributed to the final version of the manuscript.

REFERENCES

1. Del Piccolo L, Danzi O, Fattori N, Mazzi MA, Goss C. How psychiatrist's communication skills and patient's diagnosis affect emotions disclosure during first diagnostic consultations. *Patient Educ Couns.* (2014) 96:151–8. doi: 10.1016/j.pec.2014.06.001
2. Vandekieft GK. Breaking bad news. *Am Fam Phys.* (2001) 12:1975–8.
3. Mitchell AJ. Reluctance to disclose difficult diagnoses: a narrative review comparing communication by psychiatrists and oncologists. *Support Care Cancer.* (2007) 15:819–28. doi: 10.1007/s00520-007-0226-y
4. Paccaloni M, Moretti F, Zimmermann C. Giving information and involving in treatment: what do psychiatrists think? A review. *Epidemiol Psychiatr Sci.* (2005) 14:198–216. doi: 10.1017/S1121189X00007958

5. Moran GS, Oz G, Karnieli-Miller O. Psychiatrists' challenges in considering disclosure of schizophrenia diagnosis in israel. *Qual Health Res.* (2014) 42:1368–80. doi: 10.1177/1049732314547085
6. Cleary M, Hunt GE, Horsfall J. Delivering difficult news in psychiatric settings. *Harv Rev Psychiatry.* (2009) 17:315–21. doi: 10.3109/10673220903271780
7. Outram S, Harris G, Kelly B, Cohen M, Sandhu H, Vamos M, et al. Communicating a schizophrenia diagnosis to patients and families: a qualitative study of mental health clinicians. *Psychiatr Serv.* (2014) 65:551–4. doi: 10.1176/appi.ps.201300202
8. Amsalem D, Hasson-Ohayon I, Gothelf D, Roe D. How do patients with schizophrenia and their families learn about the diagnosis? *Psychiatry.* (2018) 81:283–7. doi: 10.1080/00332747.2018.1443676
9. Fisher M. Telling patients with schizophrenia their diagnosis. Patients expect a diagnosis. *BMJ.* (2000) 321:385. doi: 10.1136/bmj.321.7257.385
10. Clafferty RA, McCabe E, Brown KW. Conspiracy of silence? Telling patients with schizophrenia their diagnosis. *Psychiatr Bull.* (2001) 25:336–39. doi: 10.1192/pb.25.9.336
11. Baile WF, Buckman R, Lenzi R, Glober G, Beale EA, Kudelka AP. SPIKES—A six-step protocol for deliveringbBad news: application to the patient with cancer. *Oncologist.* (2000) 5:302–11. doi: 10.1634/theoncologist.5-4-302
12. Girgis A, Sanson-Fisher RW. Breaking bad news 1: current best advice for clinicians. *Behav Med.* (1998) 24:53–9. doi: 10.1080/08964289809596381
13. Fujimori M, Uchitomi Y. Preferences of cancer patients regarding communication of bad news: a systematic literature review. *Jpn J Clin Oncol.* (2009) 39:201–16. doi: 10.1093/jjco/hyn159
14. Mirza RD, Ren M, Agarwal A, Guyatt GH. Assessing patient perspectives on receiving bad news: a survey of 1337. Patients with life-changing diagnoses. *AJOB Empir Bioeth.* (2019) 10:36–43. doi: 10.1080/23294515.2018.1543218
15. Hilkert SM, Cebulla CM, Jain SG, Pfeil SA, Benes SC, Robbins SL. Breaking bad news: a communication competency for ophthalmology training programs. *Surv Ophthalmol.* (2016) 61:791–8. doi: 10.1016/j.survophthal.2016.04.005
16. McCluskey L, Casarett D, Siderowf A. Breaking the news: a survey of ALS patients and their caregivers. *Amyotroph Lateral Scler Other Mot Neuron Disord.* (2004) 5:131–5. doi: 10.1080/14660820410020772
17. Greiner AL, Conklin J. Breaking bad news to a pregnant woman with a fetal abnormality on ultrasound. *Obstet Gynecol Surv.* (2015) 70:39–44. doi: 10.1097/OGX.0000000000000149
18. Koochak HE, Yazdi F, Abdolbaghi MH, Salehi MR, Shadloo B, Rahimi-Movaghar A. Breaking HIV news to clients: SPIKES strategy in post-test counseling session. *Acta Med Iran.* (2016) 54:313–7.
19. Seeman M V. Breaking bad news: schizophrenia. *J Psychiatr Pract.* (2010) 16:269–76. doi: 10.1097/01.pra.0000386915.62311.4d
20. Milton AC, Mullan B. Views and experience of communication when receiving a serious mental health diagnosis: satisfaction levels, communication preferences, and acceptability of the SPIKES protocol. *J Ment Health.* (2017) 26:395–404. doi: 10.1080/09638237.2016.1207225
21. Amsalem D, Hasson-Ohayon I, Roe D, Gothelf D. The SPIKES protocol is not applied in the process of breaking bad news to patients with schizophrenia. *Isr J Psychiatry.* (2019) 56:28–32.
22. Orlander JD, Graeme Fincke B, Hermanns D, Johnson GA. Medical residents' first clearly remembered experiences of giving bad news. *J Gen Intern Med.* (2002) 17:825–31. doi: 10.1046/j.1525-1497.2002.10915.x
23. Kolarik RC, Walker G, Arnold RM. Pediatric resident education in palliative care: a needs assessment. *Pediatrics.* (2006) 117:1949–54. doi: 10.1542/peds.2005-1111
24. Meyer EC, Sellers DE, Browning DM, McGuffie K, Solomon MZ, Truog RD. Difficult conversations: Improving communication skills and relational abilities in health care. *Pediatr Crit Care Med.* (2009) 10:352–9. doi: 10.1097/PCC.0b013e3181a3183a
25. Schlegel C, Woermann U, Rethans JJ, Van Der Vleuten C. Validity evidence and reliability of a simulated patient feedback instrument. *BMC Med Educ.* (2012) 12:6. doi: 10.1186/1472-6920-12-6
26. Wallace J, Rao R, Haslam R. Simulated patients and objective structured clinical examinations: review of their use in medical education. *Adv Psychiatr Treat.* (2002) 8:342–8. doi: 10.1192/apt.8.5.342
27. Ryall T, Judd BK, Gordon CJ. Simulation-based assessments in health professional education: a systematic review. *J Multidiscip Healthc.* (2016) 9:69–82. doi: 10.2147/JMDH.S92695
28. Nellis M, Howell J, Ching K, Bylund C. The use of simulation to improve resident communication and personal experience at end-of-life care. *J Pediatr Intensive Care.* (2016) 6:91–7. doi: 10.1055/s-0036-1584684
29. Back AL, Arnold RM, Baile WF, Fryer-Edwards KA, Alexander SC, Barley GE, et al. Efficacy of communication skills training for giving bad news and discussing transitions to palliative care. *Arch Intern Med.* (2007) 167:453–60. doi: 10.1001/archinte.167.5.453
30. Abdool PS, Nirula L, Bonato S, Rajji TK, Silver IL. Simulation in undergraduate psychiatry: exploring the depth of learner engagement. *Acad Psychiatry.* (2017) 41:251–61. doi: 10.1007/s40596-016-0633-9
31. McNaughton N, Ravitz P, Wadell A, Hodges BD. Psychiatric education and simulation: a review of the literature. *Can J Psychiatry.* (2008) 53:85–93. doi: 10.1177/070674370805300203
32. Amsalem D, Gothelf D, Soul O, Dorman A, Ziv A, Gross R. Single-day simulation-based training improves communication and psychiatric skills of medical students. *Front Psychiatry.* (2020) 11:221. doi: 10.3389/fpsyt.2020.00221
33. Loughland C, Kelly B, Ditton-Phare P, Sandhu H, Vamos M, Outram S, et al. Improving clinician competency in communication about schizophrenia: a pilot educational program for psychiatry trainees. *Acad Psychiatry.* (2015) 39:160–4. doi: 10.1007/s40596-014-0195-7
34. Ditton-Phare P, Loughland C, Duvivier R, Kelly B. Communication skills in the training of psychiatrists: a systematic review of current approaches. *Aust N Z J Psychiatry.* (2017) 7:675–92. doi: 10.1177/0004867417707820
35. Kowalski C, Sathanandan S. The use of simulation to develop advanced communication skills relevant to psychiatry. *BMJ Simul Technol Enhanc Learn.* (2015) 1:29–32. doi: 10.1136/bmjstel-2014-000006
36. Liénard A, Merckaert I, Libert Y, Bragard I, Delvaux N, Etienne AM, et al. Is it possible to improve residents breaking bad news skills: a randomised study assessing the efficacy of a communication skills training program. *Br J Cancer.* (2010) 103:171–7. doi: 10.1038/sj.bjc.6605749
37. Gorniewicz J, Floyd M, Krishnan K, Bishop TW, Tudiver F, Lang F. Breaking bad news to patients with cancer: a randomized control trial of a brief communication skills training module incorporating the stories and preferences of actual patients. *Patient Educ Couns.* (2017) 100:655–66. doi: 10.1016/j.pec.2016.11.008
38. Yuan YY, Scott S, Van Horn N, Oke O, Okada P. Objective evaluation of a simulation course for residents in the pediatric emergency medicine department: breaking bad news. *Cureus.* (2019) 11:e3903. doi: 10.7759/cureus.3903
39. Smith RC, Marshall-Dorsey AA, Osborn GG, Shebroe V, Lyles JS, Stoffelmayr BE, et al. Evidence-based guidelines for teaching patient-centered interviewing. *Patient Educ Couns.* (2000) 39:37–36. doi: 10.1016/S0738-3991(99)00088-9
40. Kurtz S, Silverman J, Draper J. *Teaching and Learning Communication Skills in Medicine.* 2nd ed. Oxford: Radcliffe Medical Press.
41. Tobler K, Grant E, Marczinski C. Evaluation of the impact of a simulation-enhanced breaking bad news workshop in pediatrics. *Simul Healthc.* (2014) 9:213–9. doi: 10.1097/SIH.0000000000000031
42. Ditton-Phare P, Sandhu H, Kelly B, Kissane D, Loughland C. Pilot evaluation of a communication skills training program for psychiatry residents using standardized patient assessment. *Acad Psychiatry.* (2016) 40:768–75. doi: 10.1007/s40596-016-0560-9
43. Fallowfield L, Jenkins V, Farewell V, Solis-Trapala I. Enduring impact of communication skills training: results of a 12-month follow-up. *Br J Cancer.* (2003) 89:1445–9. doi: 10.1038/sj.bjc.6601309
44. Farooq S, Johal RK, Ziff C, Naeem F. Different communication strategies for disclosing a diagnosis of schizophrenia and related disorders. *Cochrane Database Syst Rev.* (2017) 10:CD011707. doi: 10.1002/14651858.CD011707.pub2
45. Burg LB, Daetwyler CJ, Filho GRO, Del Castanhel F, Grosseman S. What skills really improve after a flipped educational intervention to train medical students and residents to break bad news? *J Educ Learn.* (2019) 8:35. doi: 10.5539/jel.v8n3p35
46. Martin A, Weller I, Amsalem D, Duvivier R, Jaarsma D, de Carvalho Filho M. Co-constructive patient simulation: a learner-centered method

to enhance communication and reflection skills. *Simul Healthc.* (2020). doi: 10.1097/SIH.0000000000000528. [Epub ahead of print].
47. Rothman KJ. No adjustments are needed for multiple comparisons. *Epidemiology.* (1990) 1:43–6. doi: 10.1097/00001648-199001000-00010

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

frontiers in Psychiatry

BRIEF RESEARCH REPORT
published: 22 March 2021
doi: 10.3389/fpsyt.2021.632207

The Delivery of Diagnosis by Child Psychiatrists: Process Characteristics and Correlates of Distress

Ayelet Brand-Gothelf[1]*, *Ilanit Hasson-Ohayon*[2], *Nimrod Hertz-Palmor*[3,4], *Dana Basel*[3,4], *Doron Gothelf*[1,3] *and Orit Karnieli-Miller*[1]

[1] Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, [2] Department of Psychology, Bar-Ilan University, Ramat Gan, Israel, [3] Sheba Medical Center, Tel Hashomer, Israel, [4] School of Psychological Sciences, Tel Aviv University, Tel Aviv, Israel

We describe the attitudes of child psychiatrists toward diagnosis delivery (DD) and explore potential stressful factors associated with the process. Eighty Israeli child psychiatrists completed a questionnaire on their perceptions of DD of schizophrenia, autism spectrum disorder (ASD), and attention deficit/hyperactivity disorder (ADHD). We also conducted semi-structured in-depth interviews with 12 child psychiatrists who were asked to share their personal experience with DD. The questionnaire responses revealed that child psychiatrists perceived schizophrenia and ADHD as the most and least severe disorders, respectively, and its treatment as being ineffective and effective, respectively. They expressed negative perceptions toward DD of schizophrenia and positive perceptions toward DD of ADHD. The results of linear regressions revealed that some factors predicted distress accompanying DD in all three diagnoses, such as lack of professional experience, negative perceptions of DD, and the effect of parents' attitudes of opposition to the diagnosis. The interviews revealed that DD was often described by psychiatrists as an emotional experience and that the psychiatrists' age, and whether the psychiatrists identified more with the child or the parent, affected their attitude toward DD. Lastly, the psychiatrists expressed feelings of loneliness in the procedure of DD and their wish to share and reflect on their experiences with others. These findings may contribute to a better understanding of the clinically important topic of DD in child psychiatry that has not been adequately addressed and help deal with psychiatrists' challenges in this task.

Keywords: diagnosis delivery, child psychiatrists, distress, schizoprenia, autism spectrum disorder, attention deficit hyperactivity disorder

OPEN ACCESS

Edited by:
Robbert Duvivier, Parnassia Psychiatric Institute, Netherlands

Reviewed by:
Zukiswa Zingela, Walter Sisulu University, South Africa
Devashish Konar, Mental Health Care Centre, India

***Correspondence:**
Ayelet Brand-Gothelf
agothelf@gmail.com

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *22 November 2020*
Accepted: *09 February 2021*
Published: *22 March 2021*

Citation:
Brand-Gothelf A, Hasson-Ohayon I, Hertz-Palmor N, Basel D, Gothelf D and Karnieli-Miller O (2021) The Delivery of Diagnosis by Child Psychiatrists: Process Characteristics and Correlates of Distress. Front. Psychiatry 12:632207. doi: 10.3389/fpsyt.2021.632207

INTRODUCTION

The process of diagnosis delivery (DD), often involving the breaking of bad news to patients (1), includes stressful elements as physicians struggle with finding the best way to inform patients and relatives of a diagnosis that is perceived as having negative implications on various life domains (2). The physicians' perceptions of the effect of the diagnosis on the patient's life, and their attitudes specifically toward DD, were found to affect the nature of the disclosure of a diagnosis (3–5). A physician's lack of communication skills, which are essential in DD, may also increase the likelihood of the physician's experience of associated stress (2).

A few studies on physicians' experience with DD were conducted among samples that included participants from diverse medical fields. For example, Ptacek et al. (6) showed that ∼18% of a mixed sample of physicians experienced stress in the process of DD, and 42% of them reported that it lasted from several hours to several days. However, the majority of the reviews, commentaries, and reports of empirical studies on DD are focused upon medical settings that are perceived as most challenging, such as oncology, pediatric, emergency settings, and neurology [e.g., (2, 5, 7–9)]. Those reports describe the struggle, distress, and often the actual avoidance of DD among physicians.

Studies on DD in psychiatry in general and specifically in child psychiatry are relatively rare. They describe unique characteristics due to two factors: the uncertainty of the accuracy of diagnosis due to the absence of objective tests and, even more so, the social stigma of mental illness (10), which may be present among professionals as well (11). For example, professionals working in psychiatry reportedly perceive psychiatric illness in a stigmatic way, viewing it as dangerous and as possessing extensive negative implications on potential career and/or social isolation (12). In addition, professionals working in psychiatry who do not hold stigmatic attitudes may nevertheless be sensitive to the potentially harmful implications of labeling and stigma on patients and their families and may therefore experience distress accompanying DD (13). While the internalization of stigma toward mental illness is evident not only among patients but also among their family members (14), child psychiatrists may struggle with the fear that parents will view the diagnosis in a stigmatic way.

The few studies, reviews, and commentaries that have addressed DD in psychiatry assessed it mainly from the perspective of the patients and families, the majority of whom learned about the diagnosis in the hospital discharge form or in an incidental encounter with a professional staff member (15). Others adopted a comprehensive approach and assessed patients, caregivers, and professionals' perspectives and focused on the experience of DD mostly among patients [e.g., (16)]. There is only one study that did explore adult psychiatrists' experiences of DD in the setting of schizophrenia and found that, overall, psychiatrists perceived disclosure as problematic, unproductive, and harmful (13). Data on DD in child psychiatry is even more sparse, and the limited studies that do exist focus mainly on parents' attitude to the delivery of an ASD diagnosis (17–19). To the best of our knowledge, there are no studies on the perceptions of DD among child psychiatrists. The goal of our study, therefore, was to better understand the perspectives of child psychiatrists in the process of DD. Our specific aims were two-fold. First, we wanted to explore factors that are related to the attitudes of child psychiatrists toward three different disorders and toward their DD. Specifically, we hypothesized that child psychiatrists will perceive schizophrenia as the most severe mental disorder, its treatment as relatively ineffective, express negative perceptions toward its DD, and experience its DD as distressing. Conversely, we hypothesized that they will perceive ADHD as the least severe disorder, its treatment as relatively effective, will have positive perceptions toward its DD, and will experience its DD as comparatively less distressing. As for ASD, we hypothesized that psychiatrists will perceive its level of severity as moderate, its treatment as ineffective, that they will have both positive and negative perceptions toward its DD, and that that they will experience its DD as moderately distressing. Secondly, we sought to identify factors associated with the distress of child psychiatrists associated with the DD process. We hypothesized that they would include lack of professional experience, negative perceptions of DD, and the perception of parents as being in opposition of the diagnosis. To further explore additional potential factors, a qualitative exploratory component was added.

METHODS

Participants and Procedures

The participants were recruited to the current study during a conference of the Israel Child and Adolescent Psychiatry Association, which was held in January 2019. Seventy child psychiatrists who attended the conference were informed of the study's purposes and procedure and assured of anonymity, confidentiality, and their right to withdraw at any stage. After providing their written informed consent, they were asked to complete a self-report questionnaire on their positions and experiences regarding DD. An additional 40 child psychiatrists (listed in the Israeli Medical Association mailing list) who did not attend the conference received an email containing an invitation to participate, along with a link to a Google Forms online survey. All data for this survey were obtained between January 28, 2019, and February 14, 2019.

We also conducted semi-structured in-depth 1-h (average) phone interviews with 13 child psychiatrists to learn about their experiences and perceptions related to DD. Those interviewees were chosen from the child psychiatrists listed in the Israel Medical Association using a maximum variation sampling to represent a variety of professional experience, sex, and geographic distributions (20). All interviewees were contacted directly by telephone (by ABG) after they were informed of the rationale and procedure of the study, and assured of anonymity, confidentiality, and their right to discontinue the interview. Those who agreed to participate in the study gave their informed consent.

The Sackler School of Medicine Ethics Committee at the Tel Aviv University and the Helsinki Ethics Committee at Sheba Medical Center approved the study.

Measures

Sociodemographic data, including age and sex, were collected as were the years of professional experience and the presence of physical or/and mental illness among the participants' own family members. Their perceptions of severity, certainty of diagnosis, and treatment ineffectiveness for schizophrenia/ASD/ADHD were assessed with three questions for each diagnosis on a 5-point Likert scale, where 1 represented strong disagreement with perception of the diagnosis as severe, perception of the diagnosis as a certainty, and the perception of treatment as effective, while 5 represented strong agreement (the questionnaire is provided in **Supplementary Table 1**).

As there are no studies written on this topic, based on clinical experience in child psychiatry (ABG) and research experience in DD (OKM), a 15-item questionnaire was developed by the research team for the purposes of this study. The questionnaire focused on negative perceptions of DD (NPDD) on a similar 5-point Likert scale as described above. The items were averaged to produce NPDD scores and reliability (schizophrenia: Cronbach's $\alpha = 0.83$; ASD: Cronbach's $\alpha = 0.76$; ADHD: Cronbach's $\alpha = 0.87$), and contained statements such as "Giving a schizophrenia/ASD/ADHD diagnosis only leads to unnecessary grief among the family and child," "There is no appropriate way to disclose the diagnosis of schizophrenia/ASD/ADHD to a family," etc. Items that reflected a positive perception of DD (for example: "Giving a schizophrenia/ASD/ADHD diagnosis enables the family to obtain support") were reversed (**Supplementary Table 1**).

Factors that potentially influenced the decision to deliver a diagnosis (FIDD) were sought by an original 6-item inventory. Those factors were independent of each other (therefore reliability was not measured for them). The participants were asked to rate the extent to which they are influenced by each factor while making the decision about delivering a certain diagnosis on a 5-point Likert scale, with 1 representing "not influencing my decision at all" and 5 representing "greatly influencing my decision"). FIDD included queries about the influence of the child's age, family's SES, parenting, and siblings (**Supplementary Table 1**).

An original 7-item questionnaire queried about distress accompanying DD (DADD). For each item, the participants were asked to rate the extent to which they experience distress with regard to different phases of the DD procedure on a 5-point Likert scale, where one represents no distress at all and five represents a great deal of distress. Examples are: "While informing parents about the possible symptoms of schizophrenia/ASD/ADHD," "While recommending the transfer of the child to a special education program," etc. Final scores and reliability (schizophrenia: $\alpha = 0.86$; ASD: $\alpha = 0.77$; ADHD: $\alpha = 0.81$) were calculated based on the average rate of completed items (**Supplementary Table 1**).

A qualitative component using immersion/crystallization analysis method (21) included an open-ended interview focused on eliciting participants' experiences and perceptions with regard to DD of three psychiatric diagnoses: schizophrenia, ASD, and ADHD. The interview guide was designed based on former studies of DD interaction and included various invitations from participants to share their personal accounts of DD, such as the last DD, the most complicated DD, the least complicated DD, and general attitudes toward DD (5, 13). The interviews were recorded and transcribed verbatim. Two researchers (ABG and IHO) read the transcripts, after which they selected and agreed upon eight coding themes, among them recognizing DD as an emotional experience, identifying objective, and subjective factors affecting psychiatrists' level of distress accompanying DD, and recognizing whether the psychiatrist identifies with the child, parent or both. The same researchers independently coded a subsample of five participants, and the inter-rater reliability for the coding of those five participants was 0.92. The rest of the sample was coded by either one of the raters. We excluded one interview from the final analysis because of technical problems.

Statistical Analysis

Repeated-measures analysis of variance (RM-ANOVA) was applied to assess differences in the perception of schizophrenia, ASD, and ADHD regarding each of the following measures: (a) perceived disorder severity; (b) perceived diagnosis uncertainty; (c) perceived treatment ineffectiveness; (d) negative perceptions toward DD; and (e) distress accompanying DD. Next, post hoc pairwise dependent *t*-tests were conducted to compare each pair of diagnoses (schizophrenia vs. ASD, ASD vs. ADHD, and schizophrenia vs. ADHD). Bonferroni correction for multiple comparisons was applied. Three separate linear regressions were conducted to determine the association of distress accompanying DD (as the key dependent variable) with perceived severity, uncertainty, treatment ineffectiveness, negative perceptions, items of the FIDD inventory, and demographics. To avoid multicollinearity, independent variables were decontaminated from common variance by regressing them out of each other and then inserting their standardized residuals into the final model (22). Next, the models were reduced by excluding FIDD factors that did not have significant associations [$p < 0.016$ (Bonferroni correction for multiple comparisons)] with at least one diagnosis (standardized residuals were readjusted to the final variables in the reduced model). The statistical analysis was performed with the Statistical Package for Social Sciences (SPSS), v25.0, IBM, Chicago.

RESULTS

The study included 80 participants, 51 of whom completed the questionnaire during the conference (72.8% participation rate) and 29 who completed the online survey (72.5%). The participants were child and adolescent psychiatrists with a mean age of 48.7 (SD = 10.7) years, and a mean of 18.6 (SD = 10.6) years of professional experience. There were 47 females (58.7%), and 21 (26.3%) of the 89 responders reported having mental illness in the family. The demographics of the study group are presented in **Table 1**.

Attitudes Toward DD of Schizophrenia, ASD, and ADHD

Repeated-measures ANOVA revealed that the participants perceived schizophrenia and ADHD as the most and least severe diagnoses, respectively [$F_{(1,122)} = 119.4$, $p < 0.001$]. The most

TABLE 1 | Sociodemographic characteristics of the study sample.

N	80
Age, mean (SD), in years	48.7 (10.7)
Age, range, in years	33–79
Male/Female, *n* (%)	33/47 (41.3/58.7)
Professional experience, mean (SD), in years	18.6 (10.6)
Professional experience, range, in years	2–50
Having mental illness in own family, *n* (%)	21 (26.3)

negative perceptions were toward DD of schizophrenia, and the most positive were toward ADHD [$F_{(1,113)} = 111.8$, $P < 0.001$]. Distress accompanying DD was highest for schizophrenia and lowest for ADHD [$F_{(1,132)} = 116.1$, $p < 0.001$]. These results and the results of all parameters with regard to ASD are presented graphically in **Figure 1**.

Stressful Factors Among Child Psychiatrists While Delivering a Diagnosis and Their Association With Experienced Distress

As presented in **Table 2**, the following variables were associated with distress accompanying DD in all three psychiatric diagnoses: less professional experience [schizophrenia (standardized $\beta = -0.34$, $p < 0.001$), ASD ($\beta = -0.33$, $p = 0.003$), and ADHD ($\beta = -0.25$, $p = 0.010$)], negative perception toward DD [schizophrenia ($\beta = 0.43$, $p < 0.001$), ASD ($\beta = 0.38$, $p < 0.001$), and ADHD ($\beta = 0.40$, $p < 0.001$)], the perception of the child psychiatrist of parents as being in opposition to the diagnosis [(schizophrenia: $\beta = 0.48$, $p < 0.001$; ASD: $\beta = 0.23$, $p = 0.038$, marginally significant after Bonferroni correction; ADHD: $\beta = 0.35$, $p < 0.001$)], and the presence of siblings with one of the three diagnoses in the patient's family [(schizophrenia: $\beta = 0.46$, $p < 0.001$; ASD: $\beta = 0.28$, $p = 0.019$, marginally significant; ADHD: $\beta = 0.28$, $p = 0.009$)].

Qualitative Findings: Themes That Emerged From Interviews

The qualitative part of the current study involved 13 interviewees, 12 of whom completed the interview. The interviewees were all child and adolescent psychiatrists with a mean age of 46.8 (SD = 10.1) years, and an average of 16.4 (SD = 12.2) years of professional experience. Six of the interviewees were females.

The major themes that were revealed during the interviews regarding the process of DD to parents of children with schizophrenia, ASD, and ADHD were as follows:

1. DD in psychiatry is a highly charged emotional experience. Psychiatrists reported feelings of sadness, sorrow, grief, empathy, guilt, compassion, and frustration accompanying a DD. "*Before delivering the diagnosis of schizophrenia I felt tensed, my stomach was turning upside down and my heart was beating 200. It was really hard for me...;. . . after the delivery I felt as though I threw a bomb at the family. . .;. . . It broke my heart because I knew how much they didn't want such a life for their daughter. . .;. . . I couldn't stop thinking about it while at home. . . although it was a long time ago it was so powerful that I recall it as if it was yesterday. . .*"
2. DD of psychiatric disorders is a continuous process and not a time-limited task. "*I find myself delivering the diagnosis in steps, adjusting the delivery to what I believe the family is capable of hearing. . .;. . . sometimes people don't want to hear the news at first. . .;. . . they sit in front of me and listen but it seems that nothing gets through...;. . . sometimes the process of understanding and accepting takes time. . .*"
3. The challenge in preserving hope. "*I often deal with the ethical question if our role is to stick to the truth or to preserve hope. . . I feel that my role is to soften the bad news...* "*In my office I hang a picture of my only patient with a syndrome who got married...;. . . I never say out loud things that close the door to hope.....we must preserve hope not only for our patients but also for ourselves. . .;. . . our hope enables us to continue to search for treatment*"
4. During the psychiatric evaluation, a child psychiatrist tends to identify either with the child or with the parent and those choices affect the DD. Psychiatrists reported that their identification and overinvolvement with either child or parent affects their DD so that the process becomes more emotional. Younger psychiatrists reported that they tend to identify with the child and that they feel obligated to deliver the diagnosis so that the child will receive the appropriate treatment. ("*I believe that my main role is to represent the child's best interests*"), while older psychiatrists reported that they tended to identify with the parents and felt obligated to deliver the diagnosis in a vague and optimistic way ("*I try to deliver DD in an ambiguous way. It's good both for me and for the parents. For example, I might say to parents that their child has high functioning autism and that in the past children like him were not meeting the diagnostic criteria for autism. . .;. . . that there is a good chance that their child will succeed in life. . .;. . . I always keep in mind that children are their parents' greatest hope and that you need a good reason to take that hope away*").
5. Psychiatrists revealed different attitudes toward the legal principle endorsing the position of "the patient's right to know." Overall, younger psychiatrists believed that DD should be shared under any circumstances. "*I share the diagnosis as soon as I know it because I believe it's the patient's and the parents' right to know.*" Conversely, older psychiatrists believed that DD of severe psychiatric disorders should be delivered only under certain circumstances. "*I feel that to deliver a parent their child's psychiatric diagnosis is the biggest responsibility ever. I do not share the worst thoughts that run in my head with parents and I do not use the DSM vocabulary. I express only what I think people are capable of hearing and what I assume would be helpful for them. For many years I avoided saying the diagnosis of "schizophrenia" to parents and it is still hard for me to do so...; . . . sometimes I ask myself what is the purpose of giving a diagnosis that has poor long-acting outcomes. . .;. . . treatment is more important than the diagnosis.*"
6. Psychiatrists, at all ages, shared that if it was their child who was psychiatrically ill, they would have preferred to receive a clear, direct, and honest DD. "*I would want to know everything regarding the diagnosis of my own child, but this is me, it is not true for everyone. . . not everyone wants to know everything...*"
7. Main objective and subjective factors that affect psychiatrists' level of distress accompanying the DD of psychiatric disorders:
   a. The perception of the degree of coping and the strength and resilience of families.

      "*When I feel that the family has the strength to deal with the diagnosis of ASD and that the child is in good hands, I become optimistic and the process of DD becomes simple*"

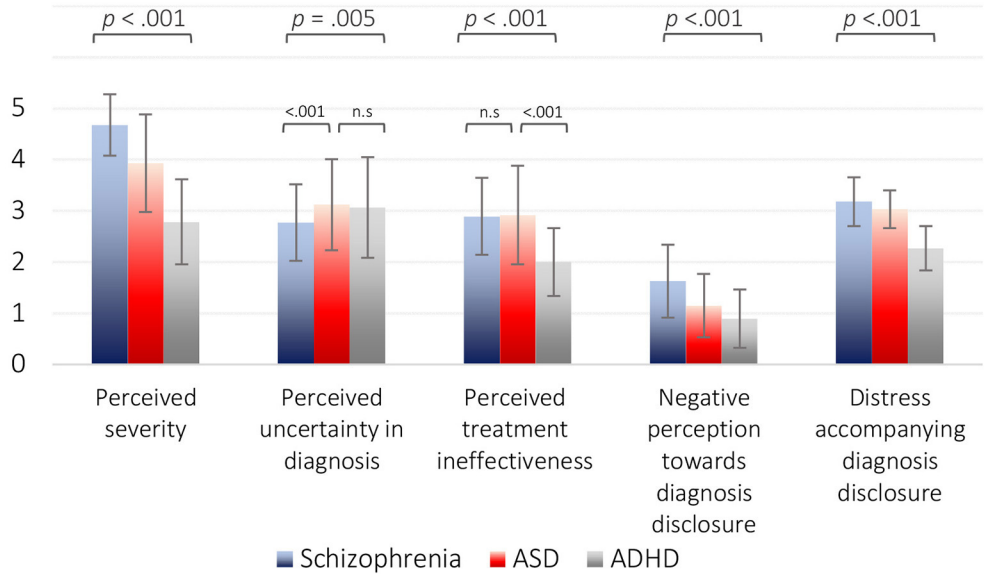

FIGURE 1 | Repeated-measures ANOVA for differences across diagnoses. Perceived severity differed significantly from that of ASD and ADHD [$F_{(1,122)} = 119.4$, $p < 0.001$]. Differences in perceived uncertainty in diagnosis [$F_{(1,133)} = 5.91$, $p = 0.005$] were derived from schizophrenia being significantly lower than the other two diagnoses ($p < 0.001$). Differences in perceived treatment ineffectiveness [$F_{(1,132)} = 46.5$, $p < 0.001$] were derived from ADHD being significantly lower than ASD and ADHD ($p < 0.001$). Negative perception of diagnosis disclosure differed significantly between all three diagnoses [$F_{(1,113)} = 111.8$, $p < 0.001$]. Distress accompanying diagnosis disclosure differed significantly between all three diagnoses [$F_{(1,132)} = 116.1$, $p < 0.001$]. Greenhouse–Geisser correction was applied for all tests.

TABLE 2 | Linear regression with distress accompanying diagnosis disclosure as the dependent variable.

	Distress accompanying diagnosis disclosure					
	Schizophrenia		**ASD**		**ADHD**	
	Standardized β (95% CI)	***p*-value**	**Standardized β (95% CI)**	***p*-value**	**Standardized β (95% CI)**	***p*-value**
Sex	**0.19 (0.02, 0.53)**	**0.037**	0.02 (−0.19, 0.22)	0.878	0.06 (−0.12, 0.25)	0.508
Professional experience	**−0.34 (−0.04, −0.01)**	**<0.001**	**−0.33 (−0.54, −0.12)**	**0.003**	**−0.25 (−0.44, −0.06)**	**0.010**
Having mental illness in own family	0.17 (−0.01, 0.57)	0.058	0.19 (−0.02, 0.40)	0.071	**0.21 (0.03, 0.40)**	**0.026**
Negative perception toward diagnosis disclosure	**0.43 (0.19, 0.47)**	**<0.001**	**0.38 (0.16, 0.59)**	**<0.001**	**0.40 (0.20, 0.59)**	**<0.001**
Perceived morbidity severity	0.18 (0.00, 0.28)	0.054	0.08 (−0.15, 0.31)	0.467	**0.24 (0.05, 0.43)**	**0.013**
Perceived uncertainty in diagnosis	0.06 (−0.10, 0.19)	0.555	0.20 (−0.02, 0.42)	0.071	0.12 (−0.10, 0.34)	0.278
Perceived treatment ineffectiveness	0.01 (−0.13, 0.14)	0.918	−0.05 (−0.27, 0.16)	0.622	−0.03 (−0.24, 0.17)	0.751
Parents oppositional/in denial toward the diagnosis	**0.48 (0.20, 0.54)**	**<0.001**	**0.23 (0.01, 0.45)**	**0.038**	**0.35 (0.15, 0.55)**	**<0.001**
Having diagnosed sibling(s)	**0.46 (0.18, 0.52)**	**<0.001**	**0.28 (0.05, 0.51)**	**0.019**	**0.28 (0.07, 0.49)**	**0.009**

After controlling for multiple covariates, professional experience was associated with less distress accompanying DD across all diagnoses. Negative perception toward DD, parents being oppositional or in denial toward the diagnosis and having diagnosed sibling(s) were associated with more distress accompanying DD across all diagnosis.
Bold indicates significant.

b. The perception of the family's readiness and willingness to receive a diagnosis "*It's easy to deliver a diagnosis to families who are willing to accept it… …I recall a situation that I disclosed a diagnosis of schizophrenia to a family that was not ready to cope with it and they never showed up again*"
c. Family situations where another child has already been diagnosed with a psychiatric disorder were reported as a burden when considering DD. "*How can I tell parents that their second child is also suffering from ASD? What will they think to themselves? Why them again?*"
d. Psychiatrist's own perception regarding the certainty of the different psychiatric disorders. "*When I deliver the diagnosis of ADHD it doesn't feel certain… …I think that there are not enough scientific data behind it. It is not equivalent to DD of cancer.*" "*DD of schizophrenia sometimes makes me feel guilty for shattering someone's dream when I am not even sure that I am right*"

8. The feelings of loneliness in the DD and the wish to share and reflect. "*Agreement with other colleagues on the diagnosis and the company of another colleague in the process of DD itself provides support and increases my confidence.*" "*I feel that the process of sharing always helps me…;..this interview made me raise questions and assisted me by providing an opportunity to reflect on this issue of DD. I wish there were more professional forums to talk and consult about the DD. I wish I had more opportunities to discuss this in my everyday life.*"

DISCUSSION

This study explored attitudes toward DD and possible stressful factors in the process of DD among child psychiatrists. The findings suggest that attitudes varied according to diagnosis and that there are multiple stressful factors while delivering a diagnosis in general, as well as unique factors that are related to a specific diagnosis. The facts that the diagnosis of schizophrenia was perceived as severe and that there is no effective treatment were found to be associated with negative attitudes toward DD. This was supported by both quantitative and qualitative data. The qualitative data revealed the challenges and dilemmas and suggested additional factors that affect child psychiatrists' attitudes toward DD: their perception concerning the legal obligation to deliver a diagnosis, their identification either with the child or with the parent, their perceptions of the parents' willingness and ability to cope with the news, and the level of devastation expected to be experienced.

The diagnosis of ASD was perceived by child psychiatrists as less severe than the diagnosis of schizophrenia, and they reported having less-negative attitudes toward DD of ASD and experiencing less stress accompanying the DD compared to that of schizophrenia. The finding that DD of ASD is perceived by child psychiatrists as less negative and stressful is interesting and may be explained by the following. In the past, both schizophrenia and ASD were considered a single clinical entity termed "childhood schizophrenia" (23). Even though the two diagnoses were subsequently separated in the DSM-III, both were considered severe disorders until the last two decades. We believe that ASD was gradually considered as a less severe disorder due to lowering the threshold of diagnosis. For example, currently the intelligence of most children that are diagnosed with ASD is within the normal range whereas in the past most of the children with the diagnosis of ASD were diagnosed also with intellectual disability (24). In addition, in Israel and in other western countries, the diagnosis of ASD enables families to receive considerable support, including treatments (e.g., applied behavioral analysis, occupational and speech therapy) and one-on-one school assistance. Thus, it can be assumed that while delivering the diagnosis of ASD, child psychiatrists perceive not only the negative implications of the diagnosis on various life domains but also the benefits of increased support that the DD of ASD will provide to the child and family.

The findings on attitudes toward DD emphasize the important effect of illness perception on the DD process. Extensive research has addressed the effects of psychiatric illness perception on patients and relatives (25, 26), showing that negative perception, mostly in the form of stigma against psychiatric disorders, interferes with an adaptive coping process [see review of (14), on parents' perceptions]. Psychiatric illness perception of professionals, however, is barely studied, probably assuming that their perception is relatively objective and less prone to biases or that, as professionals, they are less prone to be influenced by their biases. However, there is evidence that psychiatrists tend to perceive serious mental illness as schizophrenia as "bombastic" in its implications or as "being sick in mind," and ASD in child psychiatry as devastating (27), which are perceptions that were identified as likely to create reluctance to DD to patients and families (13). The findings of the current study further support those conclusions by showing an association between the perception of a given mental illness as being severe, the diagnosis as being uncertain, and the treatment as being ineffective, with negative attitudes toward DD among child psychiatrists.

The distress psychiatrists experience while practicing DD and its correlates is an additional major finding in the current study. Less professional experience, negative attitudes toward DD, and the perception that the parents opposed the diagnosis were all associated with higher DD-related stress. In line with these questionnaire responses, the qualitative analysis also showed that psychiatrists experience various negative feelings, such as sadness, sorrow, grief, empathy, guilt, compassion, and frustration while delivering a diagnosis, and even long after. This led to their wish for support and for opportunities to share and reflect with colleagues on these challenges in preparation to and following these encounters.

Our finding that psychiatrists with fewer years of professional experience reported more stress accompanying DD may be explained by the fact that DD requires high communication skills that are usually achieved over time. In addition, younger psychiatrists reported feeling obligated to deliver the diagnosis for the benefit of the child more than older psychiatrists. This feeling of obligation may limit younger psychiatrists' freedom to choose whether to delay or soften the DD and, in turn, may also explain their experience of DD as more stressful.

As had been shown in previous studies in psychiatry [see review of (16)] as well as in the present one, the process of DD included psychosocial aspects that emerged from the connection with the family and the psychiatrist's perception of the way the parents cope with the verdict. Further exploration is needed to understand the source of these perceptions and their accuracy, and perhaps find ways to help psychiatrists enhance families' resilience and willingness to accept the disease.

There are several limitations to this study that bear mention. First, it focused on DD of three diagnoses, thereby limiting generalization of the findings to other psychiatric diagnoses. Second, the study design was cross-sectional and therefore it is not clear how perception and attitudes affect the experienced distress longitudinally. Lastly, the study was conducted from the perspectives of psychiatrists and did not address the perspectives of patients and relatives. Perkins et al. (16) recently recommended a triangular approach to the understating of DD in psychiatry, which includes psychiatrists, patients, and relatives, and future studies should combine them to better explore the more inclusive dynamics of DD.

The current study highlighted the importance of perceptions and attitudes of psychiatrists in the process of DD. The findings suggest that child psychiatrists are affected by their own perception of disorders and of DD as well as by additional factors that are operative in the interpersonal domain of communicating DD. We believe that these results can assist in tailoring interventions to assist psychiatrists in coping with DD of conditions that have far-reaching ramifications as well as with their own biases. This, in turn, may improve the way DD is practiced, leading to a better experience for the psychiatrist, the patient, and the family.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Tel Aviv University Institutional Review Board and Sheba Medical Center Institutional Review Board. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

AB-G, DG, and OK-M: conceiving and designing the study. AB-G, and DB: data collection. NH-P: statistical analyses. AB-G, IH-O: qualitative analyses. AB-G, IH-O, NH-P, DG, and OK-M: data interpretation. AB-G, IH-O, NH-P, DG, and OK-M: writing of the final manuscript. All authors contributed to, reviewed, and approved the final manuscript.

ACKNOWLEDGMENTS

We wish to thank the participants of the study, members of the Israel Child and Adolescent Psychiatry Association, for their willingness to share their experience of diagnosis delivery.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.632207/full#supplementary-material

REFERENCES

1. Ptacek JT, Fries EA, Eberhardt TL, Ptacek JJ. Breaking bad news to patients: physicians' perceptions of the process. *Support Care Cancer.* (1999) 7:113–20. doi: 10.1007/s005200050240
2. Fallowfield L, Jenkins V. Communicating sad, bad, and difficult news in medicine. *Lancet.* (2004) 363:312–9. doi: 10.1016/S0140-6736(03)15392-5
3. Grassi L, Giraldi T, Messina EG, Magnani K, Valle E, Cartei G. Physicians' attitudes to and problems with truth-telling to cancer patients. *Support Care Cancer.* (2000) 8:40–5. doi: 10.1007/s005209900067
4. Meitar D, Karnieli-Miller O, Eidelman S. The impact of senior medical students' personal difficulties on their communication patterns in breaking bad news. *Acad Med.* (2009) 84:1582–94. doi: 10.1097/ACM.0b013e3181bb2b94
5. Karnieli-Miller O, Werner P, Aharon-Peretz J, Eidelman S. Dilemmas in the (un) veiling of the diagnosis of Alzheimer's disease: walking an ethical and professional tight rope. *Patient Educ Couns.* (2007) 67:307–14. doi: 10.1016/j.pec.2007.03.014
6. Ptacek JT, Ptacek JJ, Ellison NM. "I'm Sorry To Tell You." Physicians' Reports of Breaking Bad News. *J Behav Med.* (2001) 24:205–17. doi: 10.1023/A:1010766732373
7. Jiang Y, Li J, Liu C, Huang M, Zhou L, Li M, et al. Different attitudes of oncology clinicians toward truth telling of different stages of cancer. *Support Care Cancer.* (2006) 14:1119–25. doi: 10.1007/s00520-006-0071-4
8. Karnieli-Miller O, Werner P, Aharon-Peretz J, Sinoff G, Eidelman S. Expectations, experiences, and tensions in the memory clinic: the process of diagnosis disclosure of dementia within a triad. *Int Psychogeriatr.* (2012) 24:1756. doi: 10.1017/S1041610212000841
9. Karnieli-Miller O, Michael K, Eidelman S, Meitar D. What you "see" is how you communicate: medical students' meaning making of a patient's vignette. *Patient Educ Couns.* (2018) 101:1645–53. doi: 10.1016/j.pec.2018.04.004
10. Yanos PT. *Written-Off: Mental Health Stigma and the Loss of Human Potential.* Cambridge: Cambridge University Press (2018).
11. Kopera M, Suszek H, Bonar E, Myszka M, Gmaj B, Ilgen M, et al. Evaluating explicit and implicit stigma of mental illness in mental health professionals and medical students. *Community Ment Health J.* (2015) 51:628–34. doi: 10.1007/s10597-014-9796-6
12. Rao H, Mahadevappa H, Pillay P, Sessay M, Abraham A, Luty J. A study of stigmatized attitudes towards people with mental health problems among health professionals. *J Psychiatr Ment Health Nurs.* (2009) 16:279–84. doi: 10.1111/j.1365-2850.2008.01369.x
13. Moran GS, Oz G, Karnieli-Miller O. Psychiatrists' challenges in considering disclosure of schizophrenia diagnosis in Israel. *Qual Health Res.* (2014) 24:1368–80. doi: 10.1177/1049732314547085
14. Hasson-Ohayon I, Goldzweig G, Lavi-Rotenberg A, Roe D, Pijnenborge GHM. Illness representations among parents of children and adults with serious mental disorders: a systematic review and theoretical model. *Eur Psychiatry.* (2019) 58:27–37. doi: 10.1016/j.eurpsy.2019.02.001

15. Amsalem D, Hasson-Ohayon I, Gothelf D, Roe D. How do patients with schizophrenia and their families learn about the diagnosis? *Psychiatry.* (2018) 81:283–7. doi: 10.1080/00332747.2018.1443676
16. Perkins A, Ridler J, Browes D, Peryer G, Notley C, Hackmann C. Experiencing mental health diagnosis: a systematic review of service user, clinician, and carer perspectives across clinical settings. *Lancet Psychiatry.* (2018) 5:747–64. doi: 10.1016/S2215-0366(18)30095-6
17. Chiu Y-N, Chou M-C, Lee J-C, Wong C-C, Chou W-J, Wu Y-Y, et al. Determinants of maternal satisfaction with diagnosis disclosure of autism. *J Formos Med Assoc.* (2014) 113:540–8. doi: 10.1016/j.jfma.2012.07.040
18. Brogan CA, Knussen C. The disclosure of a diagnosis of an autistic spectrum disorder: determinants of satisfaction in a sample of Scottish parents. *Autism.* (2003) 7:31–46. doi: 10.1177/1362361303007001004
19. Osborne LA, Reed P. Parents' perceptions of communication with professionals during the diagnosis of autism. *Autism.* (2008) 12:309–24. doi: 10.1177/1362361307089517
20. Patton MQ. Enhancing the quality and credibility of qualitative analysis. *Health Serv Res.* (1999) 34(5 Pt 2):1189.
21. Borkan J. Immersion/crystallization. In: Crabtree BF, Miller WL, editors. *Doing Qualitative Research*. Thousand Oaks, CA: Sage (1999). p. 179–184.
22. Garson GD. *Multilevel Modeling: Applications in STATA®, IBM® SPSS®, SAS®, R, & HLMTM.* Newbury Park, CA: SAGE Publications (2019).
23. Hommer RE, Swedo SE. Schizophrenia and Autism-Related Disorders. *Schizophr Bull.* (2015) 41:313. doi: 10.1093/schbul/sbu188
24. Baio J, Wiggins L, Christensen DL, Maenner MJ, Daniels J, Warren Z, et al. Prevalence of autism spectrum disorder among children aged 8 years-autism and developmental disabilities monitoring network, 11 sites, United States, (2014). *MMWR Surveill Summ.* (2018) 67:1. doi: 10.15585/mmwr.ss6706a1
25. Lobban F, Barrowclough C, Jones S. Assessing cognitive representations of mental health problems. II. The illness perception questionnaire for schizophrenia: Relatives' version. *Br J Clin Psychol.* (2005) 44:163–79. doi: 10.1348/014466504X19785
26. Lobban F, Barrowclough C, Jones S. Assessing cognitive representations of mental health problems. I. The illness perception questionnaire for schizophrenia. *Br J Clin Psychol.* (2005) 44:147–62. doi: 10.1348/014466504X19497
27. Penner M, King GA, Hartman L, Anagnostou E, Shouldice M, Hepburn CM. Community general pediatricians' perspectives on providing autism diagnoses in Ontario, Canada: a qualitative study. *J Dev Behav Pediatr.* (2017) 38:593. doi: 10.1097/DBP.0000000000000483

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

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 31 March 2021
doi: 10.3389/fpsyt.2021.651722

Supporting Clinician-Scientist Development in Child Psychiatry: A Four-Domain Model for Individual or Programmatic Self-Reflection

*Amanda Calhoun, Olivia D. Herrington, James F. Leckman and Andrés Martin**

Child Study Center, Yale School of Medicine, New Haven, CT, United States

OPEN ACCESS

Edited by:
David Rettew, University of Vermont Children's Hospital, United States

Reviewed by:
Shekhar Seshadri, National Institute of Mental Health and Neurosciences (NIMHANS), India
Preeti Jacob, National Institute of Mental Health and Neurosciences (NIMHANS), India
Umberto Volpe, Marche Polytechnic University, Italy

****Correspondence:***
Andrés Martin
andres.martin@yale.edu

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *10 January 2021*
Accepted: *01 March 2021*
Published: *31 March 2021*

Citation:
Calhoun A, Herrington OD, Leckman JF and Martin A (2021) Supporting Clinician-Scientist Development in Child Psychiatry: A Four-Domain Model for Individual or Programmatic Self-Reflection. Front. Psychiatry 12:651722. doi: 10.3389/fpsyt.2021.651722

Background: The Albert J. Solnit Integrated Training Program (AJSP) is a novel educational initiative designed to prepare physician-scientists for independent careers in the investigation and treatment of childhood psychiatric disorders.

Methods: We conducted a qualitative study to explore the impact and active components of the AJSP through hour-long individual interviews of its enrollees and graduates. We were specifically interested in identifying individual or programmatic traits for success that could be replicated elsewhere. As components of our theoretical framework, we used sources on Strength, Weakness, Opportunity, and Threat (SWOT) Analysis as applied to healthcare, and on mentorship and career development as pertaining to child and adolescent psychiatry (CAP).

Results: Thirty-four individuals matriculated into the AJSP between 2004 and 2020, 33 (97%) of whom participated. Through iterative thematic analysis, we developed a model consisting of quadrants resulting from the intersection of a developmental perspective (spanning professional or personal spheres) and a reflective direction (with outward- or inward-facing vantage points). The model can be of practical utility through putative questions that trainees/program leaders could ask themselves by using the four domains as points of departure: (I) Individual: "Is becoming a clinician-scientist right for me?"/"What traits are we looking for in prospective applicants?"; (II) Program: "Is this the right program for me?"/"What is the right balance between structure and freedom for trainees to thrive in?"; (III) Mentorship: "What is the right number and constellation of mentors for me?"/"How can we optimize our experience and backgrounds toward the benefit of our trainees?"; and (IV) Charting Course: "Who do I want to become?"/"How can we help our charges embrace, find, or reconnect with their true vocation?"

Conclusion: Our analytic approach can help identify, refine, and replicate programs that are urgently needed to increase the workforce of clinician-scientists dedicated to improving the well-being and mental health of children and families. The model we describe can be fruitfully applied to the self-reflection by individuals or program leaders.

Although based on a single program with very specific goals, the model could also be applied to other training initiatives within psychiatry—and beyond.

Keywords: clinician scientist workforce, research training and mentoring, child and adolescent psychiatry, qualitative methods, scientific independence

What you get by achieving your goals is not as important as who you become by achieving your goals.
– Henry David Thoreau (1)

INTRODUCTION

More physician-scientists are needed to pursue research careers in understanding and addressing the pathogenesis, treatment, and prevention of child and adolescent mental health conditions (2). The shortage of clinician-scientists dedicated to the mental health needs of children is urgent given the "heavy burden on young minds" at a global level (3, 4). There is a need for combined research and clinical educational programs that can introduce scientific advances and prepare physician-scientists for interdisciplinary careers through the acquisition of advanced research skills and working collaborations with clinicians and scientists in related fields. The traditional model of training in child and adolescent psychiatry (CAP) provides opportunities for medical students and residents to participate in child and adolescent clinical services but does not typically encourage CAP trainees to pursue formal research training. This unfortunate reality has had a significant impact on the minting of new doctors in the "endangered but essential" (5) physician-scientist mold.

Innovative approaches to increase exposure to CAP during medical school have proven effective in raising awareness about the field, including its research opportunities (6), and in enhancing recruitment into psychiatry (7). In 2004, we launched a model curriculum aimed at providing newly graduated physicians with an integrated program combining training in CAP with early and ongoing formal and hands-on training in research. This program, crafted with the assistance of a national task force appointed by the American Academy of Child and Adolescent Psychiatry (AACAP), has been continuously funded since its inception through grants from the National Institute of Mental Health.

In an earlier study based on data from the program's first 15 cohorts (2), we documented that graduating medical students enrolled in this integrated training program, when compared to peers who had been similarly ranked in original match lists but ultimately pursued residency programs elsewhere, were more likely to become clinician-scientists dedicated to careers in CAP and had higher metrics of academic productivity and scientific independence. Specifically, integrated program participants outperformed their peers across the outcomes of: (1) AACAP development career awards, with a higher number of awards per recipient and a shorter time to first award; (2) PubMed entries, with more publications, more first-authored publications, a higher h-index, and a shorter time to first publication; and (3) higher federal grant (NIH K- or R-series) funding success rates ($p < 0.05$ for all comparisons). From a return-on-investment perspective, the 2.8 million dollars in R25 funding since 2004 has already yielded 4.6 million dollars in new grant funding. Quite aside from hard metrics and fiscal bottom lines, the program has led to the formation of a unique group of clinician-scientists with remarkable scientific creativity, innovation, and commitment.

As a complement to that report, we report here on a qualitative research study through which we sought to gain a better understanding of the program's unique characteristics—as viewed from the perspective of its most integral stakeholders. We were specifically interested in identifying individual or programmatic traits for success that could be replicated elsewhere. By including currently enrolled trainees and graduates to date, our findings incorporate the views of all but one of the entire 17-year cohort of AJSP participants.

METHODS

Program Description and Participants

The Albert J. Solnit Integrated Training Program (AJSP) was implemented at the Yale Child Study Center in 2004. Named after the Center's third director, the AJSP integrates training in pediatrics, psychiatry, CAP, and research competencies into a 6-year continuous experience. Participants are recruited into the program after graduation from medical school and, upon completion, become board-eligible in both general and CAP. The program's overall structure and specific details are available in prior publications from our group (2, 8) and on the AJSP website (9).

Funding for the AJSP derives from a range of sources, including traditional graduate medical education training slots through Yale-New Haven Hospital and the Veteran's Administration Hospital, which, combined, provide most of the support for four of the 6 years of training. The remaining 2 years, largely devoted to protected research activities, are funded through a combination of federal and private sources: (1) an R25 grant from NIMH (MH077823), now in its 15th year, designed to target the specific research goals of the AJSP; (2) a T32 training grant from NIMH (MH018268), now in its 36th year, which supports training infrastructure across a range of relevant disciplines; and (3) a significant amount of philanthropic support.

Annually, we receive more than 400 applicants for two available training slots. We are committed as a programmatic goal to improve diversity in the CAP physician-scientist workforce. Toward that end, we actively seek applicants from ethnic or racial groups that are underrepresented in the field of medicine, including African American, Hispanic/Latinx, and Native American or Pacific Islander. Interviews are only offered to those graduating students who have displayed during their

medical school training a clear interest in both child psychiatry and in research, preferably exemplified through published work. Each year, some 30 applicants are offered in-person interviews, with a formal selection process to finalize a ranked match list. Since the program's inception, we have matched the two available positions each year. To date, we have recruited 17 cohorts (n = 34, 2004–2026).

Data Collection, Qualitative Analysis, and Theoretical Framework

We conducted hour-long individual interviews with each of the participants. Interviews were recorded and transcribed verbatim. Deidentified transcripts were then uploaded for analysis supported by NVivo 12 software (QSR International, Melbourne, Australia).

We analyzed the transcripts using thematic analysis (10, 11), which provides theoretical freedom and flexibility to identify commonalities, and in which writing and analyzing data occur recursively alongside one another. Our analyses were framed within a constructivist framework, which welcomes and encourages attention to *reflexivity* (12), or the investigators' personal and subjective views. Two authors (AC, OH) worked independently to identify and compare codes before removing redundancies, sharing them with the other investigators for further refinement, and finalizing them into a joint codebook of overarching domains and themes until reaching *theoretical sufficiency* (13), the point at which additional data do not contribute further to the development of a given domain or theme, or to the creation of a new one. Each key theme was supported by multiple quotations. We followed best practice guidelines for the analysis, drafting, and submission of qualitative studies (14, 15). In keeping with the tenets of participatory research (16), we value the perspective of all involved participants and invited them to review and comment on our final codes, overarching conclusions, and manuscript draft.

As components of our theoretical framework (17), we used works on Strength, Weakness, Opportunity, and Threat (SWOT) Analysis as applied to healthcare (18), and on mentorship (19) and career development (20) as pertaining to CAP.

Ethics Approval

We obtained institutional review board approval from the Yale Human Investigations Committee (Protocol # 2000027895). Subjects were encouraged to participate but informed that their participation was not mandatory. They were aware that interviews were conducted as part of a research project and provided recorded verbal consent to participate in the study.

RESULTS

Thirty-four individuals matriculated into the AJSP in the 17 years between 2004 and 2020, 33 (97%) of whom agreed to participate in this study and provided consent. Participants comprised 21 graduates and 12 enrolled trainees. Sex distribution was balanced among the 33 subjects, nine of whom (27%) are members of under-represented demographic groups (five African American, three Latinx, one Native American). Two-thirds of participants have an advanced degree separate from their MD (17 PhD, 5 MPH or equivalent). Of those degrees, 17 had been conferred prior to matriculation, and 5 were earned as part of academic work during the course of the AJSP. Half of eligible participants had received financial support in the form of loan relief through the NIH Pediatric Research Loan Repayment Program.

TABLE 1 | Developmental perspectives, reflective directions, four domains, and underlying themes for clinician-scientists.

		Reflective direction	
		Outward	***Inward***
Developmental perspective	***Professional***	Program *Strengths* *Weaknesses* *Opportunities* *Threats* *Balance*	Charting course *Focus* *Method* *Calling* *Creation*
	Personal	Mentorship *Launch* *Orbit* *Landing* *Woes*	Individual *Strengths* *Weaknesses* *Opportunities* *Threats* *Balance*

Four-Domain Model

Through iterative thematic analysis, we developed the model depicted in **Table 1**. The model comprises four domains relevant to the training of clinician-scientists in CAP: (I) Individual, (II) Program, (III) Mentorship, and (IV) Charting course. Each of the domains is a quadrant resulting from the intersection of a developmental perspective (professional or personal) and a reflective direction (outward- or inward-facing).

I. Individual

The first two domains are organized using a similar "SWOT-B" rubric: (1) Strengths, (2) Weaknesses, (3) Opportunities, (4) Threats, and (5) Balance. This analysis, as applied to individuals, is outlined in **Table 2** and described below.

Strengths

Patience | Comfort With Uncertainty | Grit | Tenacity With Long-Term Goals. Participants identified several character traits that had served them well over the course of their training. *Patience* was paramount, and not only because science and scientific development take a long time, or because time was inherently necessary "to mature and tie things together," but also because the program they had joined was similarly evolving and resolving its own developmental challenges, particularly during its early years. Progressing in lockstep with their evolving program certainly required *comfort with uncertainty*, but that trait was necessary well beyond the particularities of any given program: "There are no assurances of success, or of a given experiment even working out. You just buckle up, hold on tight, trust the process, and go go go." Uncertainty could be not just tolerated but embraced, so long as there was a perspective that "the scientific journey may

TABLE 2 | Individual characteristics: SWOT-B analysis.

Theme	Construct definition	Representative quote(s)/*(Subtheme)*
Strengths	Internal positives and advantages; inherent to the individual	There is that evocative quote from the Indigo Girls: "There's more than one answer to these questions/Pointing me in a crooked line/And the less I seek my source for some definitive/Closer I am to fine." We're looking for concrete answers, but the more we're committed to that concrete part, the less successful we'll be, and probably the less happy. So part of the searching theme is finding comfort and understanding and solace in the non-answers, in something not definitive. *(Comfort with uncertainty)*
Weaknesses	Internal hindrances or vulnerabilities; inherent to the individual	The research I saw frustrated me in that it was very important in expanding the frontier of our knowledge but wasn't helping patients today with how they were doing. We needed those researchers, but that wasn't me.
Opportunities	External positives; resources available for use or incorporation	Especially as people of color and as women, we should take advantage of that when we're getting ready to leave for our first faculty appointments. Because we have been given a really wonderful gift through the program; we're capable of doing really great things and people recognize that. And so, we shouldn't sell ourselves short when we're on the launching pad to start our careers.
Threats	External hindrances or realities; impinging from outside sources	As I contemplated the financial and time horizon realities, I saw that my interest in all this research stuff could well fizzle out, that I would likely become 'just' a clinician.
Balance	The ability to incorporate competing demands toward a point of personal equipoise	In the traditional way, you are chasing these grants, and I don't think it has to be like that. You can have a combination of different things that you like to do. You can have different kinds of balance in your clinical practice, or clinical experiences in research. You don't necessarily have to commit to a single line of research; there are different ways to participate in research, to have it remain worthwhile and fun, to be meaningful.

be more than its destination" and that struggle and failure are inherent to its process:

> These years have been lovely, and I've found wisdom and I've been on a search, but I've also seen failure and encountered struggle, which I don't see as antithetical to wisdom or to searching. It's obviously part of what makes the search worthwhile, and the wisdom that much more profound.

Grit, stick-to-it-ness, and work ethic were deemed essential traits to overcome the vagaries of uncertain outcomes, as was *tenacity with long term goals* and with the inevitable (and frequent) handling of rejection in its many forms.

Self-Directedness | Intellectual Flexibility | Psychological Adaptability. Assertiveness, initiative, *self-directedness*, "being bold," and "even having somewhat of a pioneer spirit or entrepreneurial style" were deemed valuable in a setting in which trainees are given considerable range in designing their own program and research goals:

> Some folks need rulers and margins, they like the color-by-numbers approach. Others love the freedom of the blank page. You have to be a blank-page enthusiast to thrive around here. Or maybe to thrive as a clinician-scientist anywhere.

Having to change research and clinical settings periodically necessarily implied that *intellectual flexibility* was critically useful. As such, it behooves training environments to help trainees enhance such flexibility along the way, specifically around the dual skills of *learning to learn* and *learning with others*. The pace at which knowledge advances and the seemingly inexhaustible range of resources at our disposal require a different approach to learning. The information contained in the static books and lectures of old can no longer be today's mainstays. *Learning to learn* requires dynamic skills that are iteratively refined, lifelong, web-/distal- as well as person-based, asynchronous as well as synchronous, self-initiated, trainee- rather than trainer-centered, and responsive to actual challenges at the individual, community, and policy levels. As specialists dedicated to development and to human interaction, we are in a privileged position to learn not only *about* others but *with* others. Indeed, few of us could conceive of practicing alone: our work is multidisciplinary and relationship-based at its core.

Psychological adaptability was useful to acclimatize to new environments, to balance the pursuit of one's goals with the pull toward another's, to remain open to unexpected opportunities of the kind "you are never quite ready for, but where a little nudge at the right time can prove critical." Adaptability was required not only to articulate an early scientific vision but also to change it iteratively over time. Accepting the limitations of our predictive powers required a different kind of humility: "will my endpoint 6 or 10 years from now be in alignment with my goals of today?" As program directors, we were well-positioned to support the psychological adaptation and well-being of our trainees:

> My own psychotherapy and psychoanalysis, which has now been going on for a long time: that was very unexpected and ended up being a big growth driver for me. I had pigeonholed long-term therapy as something narrower, an indulgence perhaps.

Background. We relegate these traits to the end, as they are the less actionable ones by the time of matriculation. It would be disingenuous to deny that some participants had inherent advantages by the time they started the program, whether through prior research or clinical experience, by coming from the same institution, or by having an additional advanced degree (particularly an MD/PhD—"just to give us a 'fighting chance' in basic science"). However, we should note that none of these variables, including PhD status, were predictive of higher success rates in the "hard outcomes" examined in our earlier, quantitative study (2).

Weaknesses

The internal hindrances or vulnerabilities that we saw reflected in the interviews can be grouped into three distinct categories. The first may be construed as the reverse of the previous section, as *anti-strengths,* whether actual or perceived and self-imposed. For example, individuals who became impatient with lacking an active project or a concrete direction, those who sought shorter-term returns or early "wins," and those frustrated with the timescale of research (particularly in the basic sciences) were much more likely to struggle:

> They are clearly bright but when they came in and saw how unsatisfying science can be, how little reward there can be immediately, they just couldn't tolerate it, and abandoned it.

Physicians' Pathophysiology. A second category pertained less to the burdens unique to aspiring clinician-scientists, and more broadly to the toll exacted across all medical providers. Participants described a range of difficult feelings, including being overwhelmed, exhausted, unappreciated, or stretched too thin. Others reported fears of failure, confrontation, or conflict; pretending to be fine; feeling wary of a competitive environment; and having experienced (or continuing to experience) imposter syndrome. Even though several participants shared how psychotherapy had been integral to their training experience, few acknowledged personal psychopathology or its impact on their functioning. By contrast, "burnout" was a more readily used term, even as it may have conflated or overshadowed underlying struggles.

Disambiguating Ability From Drive. The third category may be more specifically relevant to aspiring clinician-scientists, for whom disappointments, doubts about personal ability, or a fear of letting themselves or others down may have additional downstream consequences. Even as several participants had considered quitting science at some point, few had felt comfortable articulating their doubts outside of the interview setting; it appeared easier to "blame" self-perceived limited abilities than acknowledge that they may no longer have had the drive to pursue science:

> I am able to do and enjoy doing science, when guided. But do I really, truly want to be a Principal Investigator (PI) and run a lab myself? I've turned down opportunities before, admitting I couldn't do something. But what if I no longer *want* to do something? That seems much harder to accept.

Opportunities

Regardless of their relative strengths and weaknesses, participants shared a common sentiment of gratitude for having the opportunity to grow and develop "in our own way, without having to sacrifice our values." Having the continuity of 6 years of training in a single program permitted trainees to explore, revisit, and refine in a recursive way "our personal narratives, so that we can work out who it is we are really aiming to become." "Pluripotentiality" was the term used by an interviewee as a common denominator for the group as a whole, with the program's flexibility for customization "permitting us to develop however it is we want, to choose what kind of psychiatrist we want to become." Others reflected back on their early and inchoate days, when they had questioned whether they were a good fit and had made the right decision selecting the program,

> … appreciating it for taking a chance on me, because some folks just jump in and it's really clear what they're going to do from the start. But that was not me: I needed a lot of time, care, and feeding to get there.

Threats

Pursuit of a clinician-scientist route was described in an interview as "so much easier *not* to do." Length of training, opportunity cost (through delayed joining of the workforce by at least 1 year), loan burden, and immigration barriers (with program eligibility restricted to U.S. citizens) were among the potentially impinging externalities that gave pause or, in some cases, led to departure from the trajectory altogether. Additional recurring concerns were the time horizon and uncertainty around scientific independence and a realistic awareness of the challenging funding environment ahead. An additional and discomforting reality was the prospect of having to compete with "pure" scientists who did not have to devote a substantial portion of their effort to clinical training and practice: "I'm up against people who dedicate 100% of their time to the lab. I simply didn't have that."

Poor role models posed a dangerous example that could have a chilling effect. A hierarchical system was described as one that could devolve into "getting so abused in academic medicine and just keep going with it. It's incredible to me. But it is a model that we have seen in medicine over and over again." Less egregious, but far more common, was the cautionary tale of the research life as "a grind" in which

> They are chronically stressed, always working on a paper, wondering where the next grant is going to come from, feeling like they're one bad grant cycle away from not being able to pay their salary. Maybe I'm just not doing it right myself. But I haven't seen that many people who've pulled it off, to be honest.

Balance

The quest for an elusive point of equilibrium was at the forefront of the thoughts of most, many of whom had seen cautionary tales of clinician-scientists perceived as "productive yes, but at the

price of appearing not so well adjusted." Among the top priorities to address during training years and beyond: integrating personal and professional goals, nurturing family life, being attentive to significant others or spouses, cultivating outside interests, and, of particular pre-eminence for those with children, being the best parents they could be.

A second aspect was at the professional level, aiming to blend the clinician and scientist constituents in proportions that made best sense for each individual. The combination of the two components was a necessity going well beyond the allotment of hours or percent effort; it was about integration into a cohesive personal narrative and trajectory, as exemplified in two complementary reflections:

> I'm trying to figure out how to make the training valuable in my work, because right now it's not particularly relevant. So far, I haven't yet found a way to directly make that knowledge applicable to my work.

> The tension I feel is that every hour that I spend writing a paper or applying for a grant is an hour that I'm *not* spending with that family or doing the work face-to-face with these kids. That's not a fair way to think about it, because publishing does allow the work to continue through other people who are doing similar things. But I'm just not about that. I have a pressing need to help real people, right now.

II. Program

Table 3 outlines the "SWOT-B" analysis as applied to the program; the resulting components are described below.

Strengths

Positive comments of the program fell into four broad categories:

Uniqueness of Structure. With no other training program organized in quite the same way, its approach stuck out:

> I've been able to customize my residency training in a way that is in line with my interests, which I don't think I would have been able to do anywhere else.

As with any idiosyncrasy, such singularity was a source of both interest and dissuasion: rather than a program of universal appeal, it became one better suited for those seeking to thrive in an environment with considerable room for customization, one that "provided the raw materials and let you 'build your own adventure.'" The program's unheralded amount of autonomy, particularly in its final 2 years, was described as "either thrilling or frightening, depending on your goals, but a definite line in the sand in terms of whether you want to be here."

Integrative Design. Incorporating clinical and research components from the outset, the program was experienced as rigorous, broad in its training experience and settings, and allowing for the simultaneous mastery of core clinical competencies and research immersion and training:

> The program allowed me to pursue research seriously. It's otherwise too easy as a physician to get swamped with clinical responsibilities and forego research.

Developmental Perspective | Early identity formation. There are other programs that seek to integrate clinical and research training, and participants had considered or interviewed at several of them. However, the possibilities narrowed considerably for applicants with a clear commitment to working with children and adolescents. The ability to work with children from the start was a highly valued aspect of the program, including through an internship year in pediatrics rather than medicine and through early exposures to inpatient and consultation-liaison child psychiatry. Incorporating a developmental framework that championed the unique needs of children and their families mirrored the values of an independent department of child psychiatry and resulted in a sense of hopefulness and enthusiasm for "working from the outset with the population and age groups we love, without having to wait."

Continuity Threads. Given that the program spanned at least three distinct departments (pediatrics, psychiatry, and child psychiatry) and a wide range of research settings, providing continuity in training, education, supervision, and longer-term career planning became paramount for the overall experience to be summative rather than piecemeal. This was approached through longer-term outpatient clinical experiences, program leaders and mentors who were "supportive and informed, but not overbearing or micro managerial," and by the bonding across classes that resulted from the program's small size. This cross-class peer collaboration proved essential in maintaining institutional memory and in providing for agency in shaping and refining the program:

> We talked about a challenging rotation and were able, as trainees, to advocate for change. That experience was so affirming, and so different from having a more boilerplate, preordained, this-is-what-you-will-do approach to training.

Weaknesses

Growing Pains. There was a clear divide in the critiques made by respondents enrolled during the first or second half of the program's existence. Those in the early years, during which components and overall design were still in flux, expressed a deep commitment to the mission of developing not only themselves but also the program with which they were affiliating themselves: "it was about survival back then, not refinement," "it was free-flowing, work-in-progress, only so much of which is a good thing." The early years were about working out the kinks, both small and large:

> It was a small operation back then, but none of the leaders seemed to be talking to each other so much, to the point where they did not coordinate their annual parties one year: symptomatic, but none of it malicious. It was just mind boggling how little coordination there was in those early years.

> There were mistakes made early on with how funding was structured when we were on grants. Some of those administrative oversights impacted my loan repayment later on. It was solved in the end, but at the time I felt abandoned and let down by the program.

TABLE 3 | Program characteristics: SWOT-B analysis.

Theme	Construct definition	Representative quote(s)
Strengths	Internal positives and advantages; inherent to the program	I picked this program because it reminded me of the flexibility we had during medical school, where they really wanted you to pursue whatever you were interested in: "We'll give you the resources and support for you to make it happen" —that sort of "can do" vibe.
Weaknesses	Internal hindrances or vulnerabilities; inherent to the program	Spanning so many programs, we could get lost in the sauce. During intern year we didn't have many check-ins, when it was an important time to lay down the bricks for what you would be doing next. And if you needed more support, you didn't necessarily have time, energy, or courage to reach out for more support at that time because you're so involved in pediatrics and far from child psychiatry.
Opportunities	External positives; resources available for use or incorporation	Having opportunities to formally visit and spend time with, to connect with talented individuals at other institutions was one of the great and unique training opportunities of the program.
Threats	External hindrances or realities; impinging from outside sources	We had tough financial problems, which is totally understandable. Running these programs is a nightmare. Getting these things funded is a disaster. Nobody hands you a bag of money to do this stuff, so it makes sense that there were financial problems.
Balance	The ability to incorporate competing demands toward a point of programmatic equipoise	When I was getting ready to leave residency and look for jobs, coming from the program was a big stamp of approval: they recognized we are as clinically strong as we are research strong and they really hustled to try to find a position for me and make something work. Which was really, really nice.

Organization. Although such larger, structural problems were resolved in subsequent years, the program continued to feel disjointed to some. Structural, cultural, and organizational differences across component departments could loom large; it could be easy to become disconnected, transient, floating in a no man's land or limbo, "too easy to get lost in the shuffle." Some described feeling during their training "so special and talked up that it led to sibling rivalry with others" or, alternatively, "so overlooked that we were left off invitations and announcements." Moreover, the program felt to some too small and insular, challenging trainees' ability to provide meaningful feedback and trusting that it would remain confidential.

Moving From Career Prognostication to Timely Diagnosis and Treatment. With an explicit goal to develop clinician-scientists ready for independent careers, the program understandably tries, during recruitment, to prognosticate which candidates will prove a good fit and be likely to succeed. As the training years go on, the outcomes in question become concretized in the form of awards, publications, or grants. Critical as these elements are to the success and longevity of the program, there were a number of comments about overlooking the parallel need to better "diagnose" and "treat" in a timely fashion. From a professional perspective of "career health," going off track scientifically or contemplating dropping out (from the program or from the pursuit of science) were described as off-limit topics, too embarrassing and shameful to bring up: "but there needs to be a way not only do talk about it, but to have 'off-ramp' options available." Similarly, bringing up personal mental health issues was described as "an additional burden" that could fall on trainees, rather than a routine part of the program's oversight of them.

Opportunities

Scholarly Settings and Social Capital. Respondents had made good use of a broad array of clinics, labs, and projects at their disposal. The variety and abundance was particularly relevant to less "traditional" applicants or interests, as in the case of fruitful partnerships with the humanities, or when facilitating a trajectory shift during training. Aside from the broad set of local opportunities, strategic efforts were made over the years to connect trainees with content experts or specific mentors at other institutions. Paradigmatic of this approach were visits organized each year by the program's chief residents to exemplary research settings in the region:

> I really broadened my outlook, both personally and professionally, during my training years here—partly through all the opportunities that were facilitated in places and with people outside of here.

Leveraging Resources. From very early on, trainees were made aware of relevant opportunities for awards or grants. These included internal and external options, as well as private and public, including the federal loan repayment project. Grant-writing skills, opportunities to present in a variety of settings, an ethos that "our teachers and mentors had more confidence in us than we ever did," and the positive reinforcement of early wins, all translated into a documented high success rate, both during training and after its completion:

> Getting outside pilot funding for my own ideas during training was so important; securing those early grants helped me build confidence that I could do it and maybe take the next step.

> There are so few people like us out there, that especially when people decide to stay primarily as researchers, we become like these coveted rare unicorns, it gets crazy. I think that the program really set us up to have this amazing launching pad.

Threats

Funding. The fiscal worries engendered by a costly program that relies in large measure on the soft monies of renewable federal grants and philanthropy are never entirely subdued. In the early years, those concerns were existential, with no assurance that the program could come into being ("one bad grant decision away from not"); now that the program is instantiated, the apprehension has shifted away from viability toward longevity.

Balance

The more readily evident sides of the equation involve its clinician and scientist components, or the harmonizing of different sites and institutional structures. But at a broader level, it may be more relevant to consider the optimal setpoint for programmatic flexibility: just how pre-determined and set ("prix fixe") or customized ("à la carte") should it be? Erring on the side of the former, the program could turn out to be not meaningfully different from the traditional approach that has led to such limited yields: an internship followed by 2 years of psychiatry, two of child psychiatry, and one of post-fellowship research. Alternatively, erring on the side of too much customization could lead to a disorienting experience, unstandardized training, and an ultimately unsustainable approach in which "anything goes."

III. Mentorship

The third domain encompasses four themes organized along an *Ignition Sequence* metaphor: (1) Launch, (2) Orbit, (3) Landing, and (4) Woes, as outlined in **Table 4** and described below.

Launch

The start and the maturing of mentorship relationships was described as a process encompassing four main subthemes:

Agency: Relationships Made, Not Found. The trainee had to show initiative and boldness, to be an active agent rather than a passive recipient in the labor-intensive work of mentorship, to have a sense of time urgency by reaching out rather than waiting for things to happen, to "be proactive in that you can't expect your mentors to initiate the contact. During those attempts to connect, you need to have a pitch ready, a selling point: you are 'selling' (yourself) as much as you are 'buying' (them)." Following through with early openings was as important as showing flexibility and adaptability in shifting gears toward a productive and mutually satisfying working relationship. Pre-assigned pairings rarely proved to be as successful, no matter now well-aligned interests appeared to be. A faculty member's excitement about their work and research proved conducive to many successful relationships, and serendipity (rather than sheer luck) in being at the right place at the right time was never taken for granted by those who benefited from it. Trainees with pre-existing connections and ongoing projects by the time of their arrival to the program had a clear advantage in securing primary mentors, but relationships cemented later on could prove as productive as those set right out of the gate.

Specificity: Where the Rubber Meets the Road. Mentorship cannot take place in a vacuum but rather comes alive in the sharing of particular projects. Content areas of mutual interest could be obvious at times but more often took sinuous paths so as to build on, rather than replicate, a mentor's area of expertise. Trainees often felt a sense of pressure to identify a primary mentor, but many were relieved to instead end up with a network of them: "Monogamy is good in marriage, but non-exclusivity may be the better way to go with mentorship." Indeed, finding mentors across a range of areas proved to be the norm rather than the exception. Some had "in the weeds, hands-on, directive" expertise in particular topics or methods, while others were better at "big picture" development, and yet others became specialists or problem solvers who could be mustered more selectively. Mentors who were able to zoom in and out from big picture to minute details were rare, but trainees had to make such zooming work, which often led to refining their supportive network.

Engagement: Meaningful Connection. Interpersonal dynamics, personality styles, and overall goodness-of-fit were essential to effective working relationships. Conducive to that end was supplanting any intimidating sense of hierarchy or distance with one of collegial partnership and being able to see and value each other as "whole persons rather than as research splices." Demographic congruence across gender, race, or professional affiliation was valuable, when it could be found. And yet, women, underrepresented minorities, and physicians working in PhD-predominant settings clearly had more to overcome:

> Where are the women physician-scientists who are going to help me figure out how to keep my research program going? There's actually not a ton of them here.

Generativity: Setting High, Yet Realistic Expectations—and Shifting to Sponsorship. Effective mentorship was viewed as a two-way street, in which both partners could contribute to each other's growth. Indeed, through the interconnection of like-minded mentees, the process became a multiple-way street, in which the support and guidance of peers led to a virtuous cycle of personal and scientific enrichment:

> We review each other's grants. We go through difficult cases, we gripe about things. All of us are at a similar stage in our development. I think the peer group sometimes is the best place to go to, just because comradery is so very important.

Mentors were in a unique position as social "matchmakers," making introductions within the home institution and well beyond. Effective mentors were able to enlarge the reach and specificity of the trainee's network. At their best, mentors embodied generosity by becoming not just rainmakers but sponsors. They did so not only by finding opportunities for funding, presenting, writing, or applying for a position, but also by encouraging their charges to take advantage at such developmentally enhancing junctures. Such mentors helped navigate what could otherwise become an overwhelming number

TABLE 4 | Mentorship: ignition sequence.

Theme	Construct definition	Representative quote(s)
Launch	Mentorship is a labor of love, its success as likely to depend on the labor as on the love parts of the equation; it requires focus and care hovering in balance over two separate domains: that of the *other's work* and that of the *other*.	They seemed more hands-on, even though what they were doing clinically and research-wise didn't totally line up with my specific interest. But there were enough parallels and this person had a large research group, much more formalized structures, lab meetings, presentations, one-on-one meetings, work with postdocs and people at other levels. And that worked well for me. The fit with the person, I think 9 times out of 10 is more important than the scientific fit.
Orbit	Mentorship provides a means through which to identify, coax, and ultimately ignite the dormant potential of another. A mentor can see what is best in a mentee and help propel it forth, often seeing this potential well before the mentee can, sometimes even as the latter's self-doubts continue.	Emotions ran high and it was stressful when I presented. But I got excellent feedback and felt like, "Oh, this is how it's supposed to be. This is how I'm actually going to refine things and move forward rather than all those muddled attempts I had made before." It was the first click that this research thing could actually happen for me. It was so helpful having a community of folks that have gone through it and made it to the other side, and who know you well and can give you honest feedback too.
Landing	Internalization can be seen as providing a useful metric for the success of the experience: Those individuals capable of invoking and making use of the other have been effectively mentored. A natural corollary is that in the process, they themselves have become mentors to others and the cycle and its transmission of values have effectively moved forth.	Have I ended any mentor experience, any mentor relationships? I have *moved on* to different projects and mentors –but I have not formally *ended* anything.
Woes	Upon first signing up to the task, mentors should remember that no matter how talented, their charges may be quite vulnerable early on. They would do well to recall how vulnerable they themselves once were, and recognize, with more awe than fear, that their influence can be enormous, but not de facto for the better.	I really wasn't well equipped to take advantage of mentorship at the stage, I just didn't really know what I was supposed to be doing or how the process worked. I am all for being active and invested in the relationship, but I needed basic guidance to get started and not lose those precious years learning the ropes.

Table's title, themes, and construct definitions are adapted from (19).

of opportunities; they praised and critiqued progress; they guided and pressed gently; but they never pushed to the breaking point:

> I think the folks who end up sticking it through with research often are those who have had generous mentors.

Orbit

We identified three discrete subthemes related to "attaining orbit," the ability to gain professional and scientific independence and to move on after postgraduate training:

Harnessing Potential: Carving Our Own Paths. A mentor's ability to see the potential of their mentees and help unleash it was described as "game-changing, if not life-changing." Trainees and graduates uniformly concurred on the critical role the program and its mentorship components had in shaping their professional trajectories, whether as subtle molding or as outright re-routing. They commented on the sheer variety of opportunities available to them, "a diversity of outlooks that so broadened my own." They appreciated being guided to novel opportunities, as much as being advised which ones to pass over, as "Saying 'no' is a hard-learned developmental task." As they found their way, many commented on their first independent forays or the intoxicating excitement and positive feedback of early successes:

> I would have never thought that I was ready to write a paper in my first few months of the program. But my mentors thought I was, and they pushed me to do it, for which I am so grateful. I've kept going ever since.

Untethering: Role Transitions. As they approached completion of their 6-year program, graduates thought back to their first job talk and their first job. They identified a vacuum regarding how best to think about and approach either of those new and anxiety-laden developmental tasks. Finding no suitable examples relevant to their very unique set of circumstances, they chose to fill the blanks instead: "I prepared a talk on how to get and negotiate a job, and on what a job talk should and shouldn't be. I realized there was no model or manual out there, so I went ahead and created it, and hopefully others can tweak it in the coming years."

Customizing: Against Equifinality. The measurable outcomes of a program designed to produce clinician-scientists are objective: grant funding, scholarly output, scientific independence, academic positions, and national or international recognition. The ability of some participants to "catch fire" during their training or early post-training years was certainly exciting and cause for celebration. However, effective mentorship and a program true to its core values need to remain aligned to the trainee rather than to the trainee's accomplishments: there can be no universal yardsticks for "success," nor for "independence" (a concept quite distinct from "*scientific* independence").

Landing

Not all successful partnerships end at the grave, last for life, or are necessarily lengthy. A careful landing may be the appropriate endpoint for an effective launch:

Transition, Not Termination. When the process runs its course well, as it usually does, mentorship relationships are not

eliminated like so much waste, but rather metabolized differently, as befits the nurturance that they provide. The process can then shift to a better developmental fit, perhaps as mutual consultants, advisors, or mere enthusiastic supporters. Formal terminations may be more fitting for psychotherapy than for academic mentorship, although gentle boundary-setting may be appropriate at times:

> "I really love the work you're doing, but I don't think that I'm able to do this to the level that would satisfy either one of us." He was fine with that. We still say hi when we see each other, but it's a little awkward, like breakup-awkward.

In such a breakup, as in any worthwhile human relationship, internalization is the proof of its success: mentorship often comes to an end, but the meaningful relationship it is based on can long endure. In fact, the best way to close the cycle of mentorship is to pay it forward by transmitting the internalized lessons of the mentor to a new generation of learners.

Woes

There are many ways in which mentorship experiences can go awry, which we distilled down to two subthemes. Although such instances were less common in our sample than were the successful relationships, they represented an outsized burden that for some led to a premature departure from research altogether. Even those participants who navigated mentorship successfully would have appreciated the opportunity to have candid discussions on "how to make difficult decisions, like leaving a challenging situation, without having to worry about career consequences."

Vulnerability: Neglect, Attrition, Competition. No matter how collegial the relationship, mentorship in an academic setting takes place within a hierarchical setting of career advancement. A mentor has real power over the mentee's progression, no matter how gently such power is wielded. Participants spoke of the position they could find themselves in

> …when you open yourself up to someone and devote everything to something: that's when you're most vulnerable and you can get hurt the most.

The range of suboptimal mentorship experiences included examples of *neglect* ("not engaged or responsive," "had to track them down," "exclusively deadline-driven in responses") and *attrition* ("too busy to keep it going," "removed from and uninterested in my day-to-day realities," "platitudes and bland encouragement were not helpful"). Some connections felt too transient to lead to meaningful connection, others left trainees feeling unwelcome, and yet others were hurtful through unsupportive criticism over not having a sufficiently specific project.

Competition took two different forms: in one, there was a sense of *working for*, rather than *working with*, a mentor, a situation in which their respective goals could become conflated, usually to the mentee's detriment:

> My mentor was too busy to spend time mentoring me. It was an approach that came across as a curt "come in and get to work." Only later, once I was close to the finish line, did he pay close attention.

More often, and on several instances, the competition was external, as when different institutions recruited mentors away, leading to destabilization or frank disruption to ongoing projects.

Ejection: When All Else Fails. No experiences of outright abuse were reported during our interviews, although they can certainly happen in the mentorship domain. This may be our good fortune or be due to the early recognition of mounting troubles. For example, trainees described acting on their apprehension by ending mentoring relationships gone wrong ("I had an uncomfortable weight every time we met," "I left feeling needy, almost groveling," "I ultimately realized it was an unproductive use of my time"). Formalizing an end to such challenging relationships proved helpful, and invariably required involvement and support from program leadership:

> Maybe I could have been more proactive and assertive, or switched sooner out of a bad situation and not spun my wheels, realizing things were not going anywhere. In the end, I am glad to have cut my losses and moved on. I certainly appreciated the support, as the last thing I wanted was any fallout.

IV. Charting Course

The last domain encompasses four themes: (1) Focus, (2) Method, (3) Calling, and (4) Creation, as outlined in **Table 5** and described below.

Focus and Method

Reflecting back on his prodigal career, the late Donald J. Cohen articulated how he had very early on zeroed in on a specific disorder (his *focus*, his *what*) and on a specific toolkit (his *method*, his *how*):

> I had a different goal—to pursue a narrow phenomenon to its roots. What if we could learn everything about a simple tic—where did it come from, what made someone vulnerable, what neurons and neurochemicals were involved, how did it get expressed or held back? How did other children feel about a child with tics, and how did their feelings make a child feel about himself? I had outlined a program of research (21).

The hallmark of the *focus* question in charting a course is being able to settle on a given diagnosis (Cohen had two main ones, autism and Tourette's syndrome). The content and aim of a career are its *what*: a commitment to a specific phenomenon (or condition, disorder or population; or, beyond the specificity of psychiatry, to any circumscribed entity or topic).

By contrast, the *method* question pertains to discrete approaches at the core of someone's expertise (Cohen had several of them: developmental psychopathology, psychoanalysis, and neurochemistry, among them). The means to pursue a question are its *how*, a powerful approach in that it can be applied to multiple goals at once.

TABLE 5 | Charting a professional course.

Theme	Questions for a clinician-scientist's self-reflection	Representative quote(s)
Focus	*What* do I want to know?	I have always had a pretty clear vision of what I wanted to do. I haven't deviated too much over the past 20 years, but science has, which is exciting.
Method	*How* do I want to know?	I've zoomed out and thought about the skills I wanted to learn, rather than zero in on any entrenched content.
Calling	*Where* can I best serve?	I become uncomfortable when I have to talk about the work because I don't want the work to become about me. It's a distinction that's personally important because in our work, there is a risk of ourselves taking primacy or over the patients we're supposed to be serving.
Creation	*Which* unique position will I hold someday that does not yet exist?	And now I'm in this highly technological space, where I'm doing work with engineers and developing biosensors and working on app development and things that a traditional child psychiatrist does not and would not do. And because I'm a researcher I've had the space to pivot to that new space while still working within clinical child psychiatry populations.

Table's title and themes are adapted from (20).

The challenge for many clinician-scientists early in their trajectories is in liking too many *whats* but not any one of them so much as to want to make it their own. The humble tic, by virtue of being small and narrow, had proven irresistible for Cohen, a perfect soil on which he went on to plant and harvest through the methodological *hows* of biology, genes, imaging, and psychoanalysis. No such luck for many, perhaps most: "if I settle in on this choice, will I close myself off prematurely to other opportunities?" "just how narrow do I have to become in my interests to make my research career happen?" "am I exploring shifting interests or just dabbling aimlessly?"

The focus and method constructs may be best fitting for those pursuing careers in "uppercase-R Research," aiming to be principal investigators, leaders of programs that create new knowledge; in brief, all-in scientists or clinician-scientists. Having a well-defined focus-method pairing may in fact be required for success in Research, particularly when assessed through clearly delineated metrics that are either fiscal (NIH priority scores, dollar amounts in grant funding) or academic (scholarly output, bibliometric indices).

However, trainees need to recognize that finding an optimal focus-method pairing can take time, involve fits and starts, dead ends, cul-de-sacs, and shifting of gears. The process can be as rational and deliberative as it can be sculpted by chance encounters and serendipity. Aspiring clinician-scientists need to be not just patient, but self-compassionate as well with what can be a lengthy process rife with normative, rather than exceptional, disappointments and rejections. Moreover, clinical research in child psychiatry has added complexities to consider, particularly around the "harder" and "softer" sides of its knowledge base:

> …there's so much diagnostic fuzziness. And then in spite of that, many psychiatric disorders are so highly heritable ... that I think it's really exciting, tying something so precise and quantitative to something as fuzzy and ill-defined.

In turn, program leaders need to be cognizant that all trainees, no matter how seemingly settled on a given direction, will need support and guidance in order to balance the breadth of their educational requirements with the depth necessary for research. Additionally, a proportion of candidate may not settle ultimately on a clearly defined and explicit research goal; some may be fulfilled with "little-r" research projects (as in education, training, or quality improvement, for example). It behooves program leaders to help each of their trainees find a path that is fitting and satisfying, a path that is responsive to their true calling.

Calling

By virtue of their long training, aspiring clinician-scientists have been socialized to set out goals and pursue them doggedly. They would not be physicians today, let alone pursuing such advanced education, had they not set out to master 5- and 10-year plans and long to-do lists. Given this professional upbringing, it is only natural that they are keen on pursuing targeted goals. Noble and worthwhile as this approach is, we would argue that we have done much less for our trainees when it comes to heeding the calls coming their way. Overtly centered on *what* and *how* to pursue, we all too often collude in losing sight of the *where* and the *who* reaching out to them. To misquote JFK, they should not ask what they can do for their country, but rather listen to what their country may be asking of them.

The term "calling" is usually understood in the sense of altruism, of doing something for its own good rather than for the rewards it may confer. In the case of medicine, for example, calling may be less about wanting to fix (as this would entail that our patients are somehow broken), to cure (as we often manage instead, particularly in the case of chronic conditions), or to benefit (financially or otherwise). Instead, calling should be construed around a wish to *serve* others: to ease their suffering when possible, and to bear witness and accompany them along the way even when not.

There is another way of conceptualizing "calling" —a more literal way, one more akin to listening. Each one of our trainees has to identify where it is that they are geographically, institutionally, and professionally situated at any given time: weighty decisions regarding the *where* and the with *whom* to build a residency, a fellowship, or a longer-term settled life. These places and individuals can, and often do, change over time. It is perfectly acceptable, normative in fact, to change "teams" or affiliations. But once settled in a given setting, the key is to listen attentively to what it is that may be missing, to what that location, those colleagues, and that community may be lacking. With the serious workforce shortage in child and adolescent mental health across our country and the world, clinician-scientists can be certain that there will be much that is needed and will be asked of them. It is up to them to listen in, as multiple fronts are sure to be *calling* on them.

As child and adolescent psychiatry graduates, the search for those elusive settings may be actually rather simple, the answers laying hidden in plain sight all along. Their focus is on children, adolescents, their families and the communities in which they live; their method, the vast toolkit of the profession. The two axes of their focus and method can thus effectively ground and place them. As they settle on a given setting, they can set out to find out what in its lineup may be lacking. Each and every setting will need and call upon them; it is up to them to heed the call—and for program leaders to help them heed it. Whether at a clinic, school, hospital, research lab, or any other setting; and at whatever level of training or years after graduation, everyone participating or leading the program had better listen up, for the call is surely out there.

The source of the call may have been very personal for some, who became invested through personal or familial psychopathology: "it is more than defensive sublimation: trying to address what ails us or our loved ones is a noble and worthwhile effort." Others may have gravitated more generally to the suffering of fellow humans:

> …none of these things, fortunately, were in my family. No one had a hard time like this, so it wasn't personal for anyone close to me. It was really being around the kids in the clinic through my work in medical school and residency that got me interested. This is a disorder that really needs help. Children and their families need help. We need better treatments.

The social and racial unrest that became more overt in recent years, and particularly following the 2020 syndemic of COVID-19 and racial inequity, gave a renewed urgency to "community relevance, not just publications when our house is on fire." The opportunity—indeed, the responsibility—to address communal and societal challenges, "to telescope out from the single child," "to communicate with the public and share hope," "to take on the messy realities out there" was invigorating for yet others:

> I only knew about community-based research because I got a degree in public health, where everybody knows about it as common knowledge. But as a psychiatrist, as a physician, it is not yet part of our standard vocabulary. I want to address that gap.

Creation

Identifying a job and devoting one's life to it is a formerly effective approach to employment that has diminishing relevance in today's world. And what is true for workers of factory plants, rustbelts, or mechanized farms is similarly applicable to clinician-scientists, who are overwhelmingly likely *not* to remain in a single academic setting for life. They should celebrate this fact. They should embrace vast new opportunities. And they should be instrumental in their creation.

The job that you will have someday does not yet exist. When we first heard these words from well-meaning mentors, we were scared silent. Inventing a future job from scratch appeared too ill-defined, amorphous, and inchoate a proposition for some as comfortable with structure, security, and predictability as we were. However, time proved the prescient wisdom of those words, as we each have seen ourselves and so many of our colleagues reinvent themselves professionally, moving in a way that hardly seemed linear at the time, but that in retrospect appeared so natural—predestined almost.

These words can prove frightening to young trainees, just as they once scared us; alternatively, they may come across as too abstract to be of much use. To that end, we have come to suggest a more direct and even prescriptive approach, a thought experiment for trainees to entertain and revisit periodically:

Their very own creation, the one tailored to their unique needs and talents, this one-of-a-kind bespoke, may not yet exist. It is up to them to design this beautiful "garment" of theirs. And if they can think of no way of doing so, we invite them to a challenge that helped us as first-time tailors. For starters, think of how to give back. Whether their reach is local or global; whether it centers on patients, parents, or professional colleagues; whether it is through research, volunteer, educational, or any other means, they *can* give back. And when they think back to the first three domains they worked so hard to claim as their own, remind them they have valuable and rare skills: they have a focus (children), a method (their child psychiatry toolkit), and a team to call their own (the setting or location calling on them). The one thing remaining is to have those hard-earned skills meet with a commitment to service: it is at the intersection of skills and service that they will be able to give back, and in so doing, to live a more fulfilling life, both professionally and personally:

> …the program allowed me to see myself as a leader and also see that maybe the problem of why I hadn't seen myself as a leader or as leading a lab before was because I thought there were probably enough of those people around. The program helped me realize we were the ones we had been waiting for.

DISCUSSION

The findings from this qualitative study of an integrated clinical and research training program, including the four-domain model we developed, can have practical utility for stakeholders involved in the education of clinician-scientists,

particularly—though not exclusively—those in the field of child and adolescent mental health. To illustrate the model's practical utility, we provide examples of lessons learned in going through this exercise. Finally, we address the study's limitations and future opportunities.

Practical Utility of the Four-Domain Model

A useful way of approaching the model is through putative questions that relevant stakeholders could ask themselves by using the domains as points of departure:

Individual

A medical student contemplating the momentous decision of which program to apply to may ask herself: "Is becoming a clinician-scientist right for me?" The themes and subthemes in the first domain may be a useful rubric through which to self-reflect and have additional and specific criteria to better answer the question. For example, "How comfortable will I be in developing an independent project of my own?" "Do I want to *explore* my research interest, or am I ready to *commit* to it?" In turn, program directors looking to identify the most suitable and best-fitting applicants may consider, "What traits are we looking for in our clinician-scientist trainees?", "What can we learn about them above and beyond traditional metrics?" Questions such as these can be incorporated as a complement to domains of Career Construction Theory (CCT) (22), as was recently applied to interns who chose careers in psychiatry (23): *concern, control, curiosity, confidence*, and, of particular relevance to future investigators, *contribution*.

Program

Once set on a clinician-scientist direction, a candidate can go on to ask: "Is *this* the right program for me?" "Does its balance between structured and unstructured components work for me?" "Just what is the right amount of structure and freedom for me to thrive in?" For their part, directors and developers can contemplate, "How can we improve and optimize the program?" In the next section, and based on our own experience, we provide two concrete answers to this question.

Mentorship

By the time a trainee is settled on a program, en route to it in fact, the questions should swivel to how to maximize the training experience: "Who in the program can help me make the most of my time there?" "What is the right number and constellation of mentors for me?" It could be limiting or even risky to rely on a single mentor, yet an overabundance of mentors could become dilute, confusing, or simply too time-consuming. The sequence and timing of mentor outreach is important, as is bearing in mind that even brief mentorship encounters can be incredibly productive. For their part, mentors and would-be mentors can consider, "How can I be the best mentor for this particular trainee?" or "How can I optimize my experience and background toward the benefit of someone else?"

Charting Course

The fourth domain does not lend itself to as clear a distinction among the perspectives of trainees, mentors, or program directors. And that is because the charting of a career's course should be a lifelong quest for each and every one of us. In answering the key question "Who do I want to become?" words adapted from Frederick Buechner (24) can prove essential: *Where your deep gladness meets the world's deep hunger is where you should be: there lies your vocation.* The reply we would give our charges works just as well when self-directed: Don't let them worry alone if they can't figure it all out at once; they may get there sequentially, but then again, they may not. Help them anticipate and adapt to change and the certainty of vicissitudes. Support them during the time it will take to find out what gives them real joy, what is the deep gladness looking to break out of them. Help them embrace, find, or reconnect with their true vocation. They will find it at the crossroads of their deep gladness and the deep hunger out there—a hunger so keenly felt by those they are privileged to serve.

Applying the Model: Two Examples of Program Enhancement Opportunities

Participants in the study showed remarkable candor. It was clear that by not holding back in either enthusiasm or critiques, they were providing constructive feedback to a program they care deeply about, whether as trainees or alumni. However, there were two aspects in which they seemed more circumspect, finding it harder to share with quite the same level of comfort or openness: their personal mental health, and doubts about long-term commitment to research. Rather than pressing the issues during the interviews, we have taken them as a call for action.

Healer, Heal Thyself: Addressing Physicians' Mental Health and Well-Being

Several participants shared their involvement in psychotherapy, commenting on how useful it had been to their clinical work or personal development. Notably, the experience was described using terms more relevant to *training* than to *treatment*, e.g., "growth-enhancing," "enriching," "useful," "being on the other side." Moreover, no one overtly acknowledged personal psychopathology, which would represent a major statistical anomaly, considering the high prevalence of psychiatric illnesses in young adulthood. Indeed, physicians have rates of depression even higher than the lay public (25). As a group, physicians are notoriously poor at identifying or addressing their own mental health needs, and psychiatrists may fare no better than other specialists (26). If anything, the experience in our study is paradigmatic of a much larger crisis affecting the house of medicine.

Outlining a comprehensive approach to addressing the mental health needs of our program's trainees is beyond the scope of this article. Still, general guidelines that we have started to institute are pertinent. First, it is critical to not conflate exhaustion or burn-out with mental illness; discussions about the former are certainly important and can lead to recognizing the latter. However, all too often, depression and other serious conditions can go unrecognized and untreated, construed instead as externalities with bland solutions like wellness initiatives. Second, we will continue to provide release time for therapy, not only as the training enhancer that it certainly can be, but embraced without

shame or stigma as treatment. Third, our institution's office of graduate medical education has streamlined the confidential referral to appropriate treatment. Finally, it behooves training leaders and senior faculty to lead by example in sharing their own lived experiences with mental illness:

> The medical adage to "see one, do one, teach one" also rings true for judgment and self-care around mental health. However, most [trainees] do *not* see their attendings talk as casually about how an antidepressant or psychotherapy helped them get over depression as when a steroid injection or physical therapy helped their tennis elbow. In turn, they then do *not* comfortably admit feeling depressed, and in turn will *not* teach the next generation of trainees to get support when needed. As a result, stigmatized views about mental illness become entrenched and internalized, and each new class of trainees is flooded with lots of *talk* about self-care, without the commensurate role-modeling *walk* by their superiors (27).

In earlier work we have empirically demonstrated the salutary effects of sharing lived experiences with medical students (27, 28) and with physician assistants (29). We don't necessarily need to conduct a similar study with clinician-scientist trainees in CAP, but it would be inexcusable not to apply the lessons we have learned: sharing histories of personal vulnerability by senior faculty can lessen stigmatized and self-stigmatized views of mental health and normalize help-seeking behaviors among trainees.

Opting in Is Not Copping Out: Guidance and Support in Selecting the Right Road

A number of participants alluded to "buyer's remorse" early in the program, or to recurrent, gnawing doubts about their decision to become clinician-scientists later on. Such questioning was not universal but certainly not rare either. Further, the discomfort with even skirting around the edges of the issue was evident. Trainees with as stellar backgrounds, trajectories, and promise could be paradoxically set up for the shortcomings of a medical culture and implicit hidden curriculum that make trainees feel like there is no room for mistakes in medicine, space for flaws in their personal makeup, or for rerouting their professional trajectories. Being in a high-pressure, outcome-driven, and demanding environment can set the stage for imposter syndrome feelings, narcissistic injury, or fear of being "outed" as somehow lacking.

As leaders, it is incumbent on us to prioritize our trainees' developmental needs and well-being over our program's outcomes: the *person* must always take precedence over their *product*. Concretely, we need to make it clear that, for certain trainees, selecting a different path should not be considered a failure when either the push away from science, or the pull toward something else is too strong to be ignored:

> As I considered leaving research after so many years of training, I struggled with the idea of letting people down…I felt that transitioning to a clinical career could cause irreparable damage to relationships with the very people that supported and believed in me, leaving me isolated. Leaving would mean foregoing rich academic resources to conduct research that could—potentially, elusively—lead to treatments with an impact on the lives of so many. Instead I opted to dedicate myself to clinical work that would touch a significantly smaller number of people but would do so at a timescale and community immediacy I longed for. At the end of the day, it was those very mentors, family, and peers who encouraged me to apply the knowledge I had gained in the way that was most fulfilling for me…I did not "leave" anything. Instead, I arrived at a way of leveraging my personal story, my training, and my love for improving the lives of youths and families in my small, under-resourced community. I am at peace (30).

LIMITATIONS

First, we recognize that, as direct stakeholders directly involved in the AJSP, our views may be biased in a way than an outsider's might not be. To that end, we do not consider this study a formal evaluation of the program, for that purpose relying instead on the annual metrics set out by appropriate governing bodies, and on reporting requirements from funding agencies. Moreover, we have an external advisory board, and additionally conducted a consultation with outside experts after the initial decade of the program. We should also note that there was a substantial amount of feedback about programmatic granularities that we left out of this analysis and which may still prove useful in our efforts to improve the overall quality of the program in moving forward. Second, we did not interview stakeholders other than current trainees and graduates from the AJSP; the perspectives of program leaders, mentors, and external advisors are thus lacking. Finally, we recognize the limitations inherent to a single-site study conducted in a developed country and high-resourced setting. However, we consider having done well on the trustworthiness of our report as reflected by two qualitative constructs (31, 32): (1) *credibility*, or the plausibility of our descriptions being recognized by its participants (a concept akin to internal validity); and (2) *transferability*, or the applicability of findings to other settings and programs (akin to generalizability or external validity).

CONCLUSIONS

In summary, we conducted a qualitative study based on individual interviews of all participants enrolled over the course of the 17-year history of a program designed to develop clinician-scientists dedicated to child and adolescent mental health. We developed, through iterative thematic analysis, a four-domain model resulting from the intersection of a developmental perspective (spanning professional or personal spheres) and a reflective direction (outward- or inward-facing vantage points). The model can be fruitfully applied to individual or programmatic evaluations and can help identify, refine, and replicate programs that are urgently needed to increase the working force of clinician-scientists dedicated to advancing the child and adolescent mental health agenda.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

This study involved human participants and was reviewed and approved by the Yale Human Investigations Committee (Protocol # 2000027895). Written informed consent for participation was not required for this study in accordance with national legislation and institutional requirements.

AUTHOR CONTRIBUTIONS

AC and AM designed the study. AC conducted the interviews. AC and OH took the lead in analyzing the transcripts. AM drafted the first version of the manuscript and is responsible for the integrity of the data and the analyses. All authors reviewed and contributed to working drafts and approved the final submitted version.

FUNDING

This work was supported by the Riva Ariella Ritvo Endowment at the Yale School of Medicine, by the Associates of the Yale Child Study Center, and by NIMH Grants T32 MH018268 and R25 MH077823, Research Education for Future Physician-Scientists in Child Psychiatry.

ACKNOWLEDGMENTS

We appreciate the participants' engaged participation and dedicate this work to Drs. Albert J. Solnit (1919–2012) and Donald J. Cohen (1940–2001), the third and fourth directors of the Yale Child Study Center (1966–1983 and 1983–2001, respectively). In loving memory.

REFERENCES

1. Thoreau HD. *Misattributed? Quote Investigator*. Available online at: https://quoteinvestigator.com/2016/12/06/reach-goal/. Published 2006 (Accessed January 13, 2020).
2. Calhoun A, Bloch MH, Stubbe D, Leckman JF, Martin A. Integrating clinical and research training in child psychiatry: fifteen-year outcomes of a federally supported program. *Child Adolesc Psychiatry Ment Health*. (2020) 14:1–10. doi: 10.1186/s13034-020-00328-4
3. Erskine HE, Moffitt TE, Copeland WE, Costello EJ, Ferrari AJ, Patton G, et al. A heavy burden on young minds: the global burden of mental and substance use disorders in children and youth. *Psychol Med*. (2015) 45:1551–63. doi: 10.1017/S0033291714002888
4. Baranne ML, Falissard B. Global burden of mental disorders among children aged 5–14 years. *Child Adolesc Psychiatry Ment Health*. (2018) 12:1–9. doi: 10.1186/s13034-018-0225-4
5. Rosenberg L. Physician-scientists—endangered and essential. *Science*. (1999) 283:331–2.
6. Kishore A, Sun K, Guth S, Kolevzon A, Martin A. Child and adolescent psychiatry perceptions and career preference: participation in a national medical student conference improves outcomes. *J Am Acad Child Adolesc Psychiatry*. (2020) 59:3–7. doi: 10.1016/j.jaac.2019.07.949
7. Himmelstein R, Guth S, Enenbach M, Margaret M, Stevens H, Kolevzon A. Psychiatry match rates increase after exposure to a medical student mentorship program: a multisite retrospective cohort analysis. *Acad Psychiatry*. (2020). doi: 10.1007/s40596-020-01210-3
8. Stubbe D, Martin A, Bloch M, Belitsky R, Carter D, Ebert M, et al. Model curriculum for academic child and adolescent psychiatry training. *Acad Psychiatry*. (2008) 32:366–76. doi: 10.1176/appi.ap.32.5.366
9. Albert J. *Solnit Integrated Training Program (AJSP) at the Yale Child Study Center*. Available online at: https://medicine.yale.edu/childstudy/education/psychiatry/integrated/ (Accessed December 23, 2020).
10. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. (2006) 3:77–101. doi: 10.1191/1478088706qp063oa
11. Kiger ME, Varpio L. Thematic analysis of qualitative data : AMEE Guide. *Med Teach*. (2020) 42:846–54. doi: 10.1080/0142159X.2020.1755030
12. Finlay L. Negotiating the swamp: the opportunity and challenge of reflexivity in research practice. *Qual Res*. (2002) 2:209–30. doi: 10.1177/146879410200200205
13. Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant*. (2018) 52:1893–907. doi: 10.1007/s11135-017-0574-8
14. Creswell J, Klassen AC, Plano V, Smith KC. Best practices for mixed methods research in the health sciences. *Methods*. (2011) 29:1–39. doi: 10.1002/cdq.12009
15. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Heal Care*. (2007) 19:349–57. doi: 10.1093/intqhc/mzm042
16. Bergold J, Thomas S. Participatory research methods: a methodological approach in motion. *Hist Soc Res*. (2012) 37:191–222. doi: 10.17169/fqs-13.1.1801
17. Varpio L, Paradis E, Uijtdehaage S, Young M. The distinctions between theory, theoretical framework, and conceptual framework. *Acad Med*. (2020) 95:989–94. doi: 10.1097/ACM.0000000000003075
18. Van Wijngaarden JDH, Scholten GRM, Van Wijk KP. Strategic analysis for health care organizations: the suitability of the SWOT-analysis. *Int J Health Plann Manage*. (2012) 27:34–49. doi: 10.1002/hpm.1032
19. Martin A. Ignition sequence: on mentorship. *J Am Acad Child Adolesc Psychiatry*. (2005) 44:1225–9. doi: 10.1097/01.chi.0000183462.57025.bd
20. Martin A. Focus, method, calling, and creation: on charting a professional course. *J Am Acad Child Adolesc Psychiatry*. (2020) 59:1010–11. doi: 10.1016/j.jaac.2020.02.011
21. Cohen D. Into Life: autism, Tourette's syndrome and the community of clinical research. *Isr J Psychiatry Relat Sci*. (2001) 38:226–34.
22. Savickas M. *Career Construction Theory*. Available online at: http://www.people.ku.edu/$\sim$tkrieshok/epsy846/lectures/career_construction.htm (Accessed December 24, 2020).
23. Russo RA, Dallaghan GB, Balon R, Blazek MC, Goldenberg MN, Spollen JJ, et al. Millenials in psychiatry: exploring career choice factors in Generation Y psychiatry interns. *Acad Psychiatry*. (2020) 44:727–33. doi: 10.1007/s40596-020-01323-9
24. Buechner F. *Wishful Thinking: A Theological ABC*. New York, NY: HarperCollins Publishers (1973).
25. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clin Proc*. (2015) 90:1600–13. doi: 10.1016/j.mayocp.2015.08.023
26. Summers RF, Gorrindo T, Hwang S, Aggarwal R, Guille C. Well-being, burnout, and depression among north American psychiatrists: the state of our profession. *Am J Psychiatry*. (2020) 177:955–64. doi: 10.1176/appi.ajp.2020.19090901

27. Martin A, Chilton J, Gothelf D, Amsalem D. Physician self-disclosure of lived experience improves mental health attitudes among medical students: a randomized study. *J Med Educ Curric Dev*. (2020) 7:1–10. doi: 10.1177/2382120519889352
28. Martin A, Chilton J, Paasche C, Nabatkhorian N, Gortler H, Cohenmehr E, et al. Shared living experiences by physicians have a positive impact on mental health attitudes and stigma among medical students: a mixed-methods study. *J Med Educ Curric Dev*. (2020) 7:1–9. doi: 10.1177/2382120520968072
29. Neary S, Ruggeri M, Roman C, Kamauf R, Chilton J, Martin A. Positive impact of self-disclosure through synchronous videoconferencing on attitudes to mental health among physician assistant students: a mixed methods study. *J Physician Assist Educ*. (2021).
30. Weathers J. Attachments: my journey into research and why I opted for a different road. *J Am Acad Child Adolesc Psychiatry*. (2020) 59:1312–3. doi: 10.1016/j.jaac.2020.02.009
31. Ramani S, Mann K. Introducing medical educators to qualitative study design: twelve tips from inception to completion. *Med Teach*. (2016) 38:456–63. doi: 10.3109/0142159X.2015.1035244
32. Tavakol M, Sandars J. Quantitative and qualitative methods in medical education research: AMEE Guide No 90: Part II. *Med Teach*. (2014) 36:838–48. doi: 10.3109/0142159X.2014.915297

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

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 13 April 2021
doi: 10.3389/fpsyt.2021.624005

E-Learning Is Not Inferior to On-Site Teaching in a Psychiatric Examination Course

Christoph Rauch[1†], *Janine Utz*[1†], *Miriam Rauch*[2], *Johannes Kornhuber*[1] *and Philipp Spitzer*[1*]

[1] *Department of Psychiatry and Psychotherapy, Friedrich-Alexander-University of Erlangen-Nuremberg, Erlangen, Germany,*
[2] *Department for Vascular Surgery, Neumarkt Hospital, Neumarkt in der Oberpfalz, Germany*

Background: Implementing e-learning into medical education is a growing field of research. Researchers have had positive experiences so far, and evidence suggests it to be no less effective than offline teaching. However, there are a few findings concerning psychiatric education and the use of simulated patients online.

Methods: We developed an online workshop for medical students at our psychiatric clinic, including group work exercises, lectures, and interviews with simulated patients. To compare the learning outcome, a cohort of students learning online was compared with a previous cohort that learned on-site. The same objective structured clinical examination (OSCE) was used in both cases. Evaluation questionnaires were gathered from students and lecturers and were compared with the former semesters along with the exam results.

Results: The exam grades did not significantly differ between on-site and online teaching, even though students rated their own communication skills better with online teaching. We also found that the connection experienced between students and teachers was impaired without on-site contact.

Discussion: We conclude that an online course may be an effective alternative to on-site teaching but requires further improvement to maintain a dependable student–teacher relationship.

Keywords: digital teaching, online learning, medical education, simulated patients, communication skills, psychiatry, on-site teaching, practical course

OPEN ACCESS

Edited by:
Doron Amsalem,
Columbia University, United States

Reviewed by:
Aspasia Serdari,
Democritus University of Thrace, Greece
Mariela Mosheva,
Sheba Cancer Center, Sheba Medical Center, Israel

***Correspondence:**
Philipp Spitzer
philipp.spitzer@uk-erlangen.de

[†] *These authors have contributed equally to this work*

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

Received: *30 October 2020*
Accepted: *03 March 2021*
Published: *13 April 2021*

Citation:
Rauch C, Utz J, Rauch M, Kornhuber J and Spitzer P (2021) E-Learning Is Not Inferior to On-Site Teaching in a Psychiatric Examination Course. Front. Psychiatry 12:624005. doi: 10.3389/fpsyt.2021.624005

INTRODUCTION

For many years, e-learning has been a growing field. In medical education, patient interaction and the special skill set of physicians call for specific teaching methods. There are several reports showing that e-learning is as effective as conventional lectures and that even practical courses can successfully be held online. However, evidence is still lacking (1–3).

Specifically, there are a few findings regarding the teaching of psychiatric examination and communication skills online. When considering the constructive alignment of the learning process, it becomes clear that communication can only be learned by communicating (4). While the use of simulated patients to teach and test practical and communicative skills is well-established (5–7), it is unclear whether it can be transferred to an online learning environment with video conferences.

When discussing digital teaching alternatives, the students' as well as the lecturers' preferences should be considered (8, 9).

We transferred the contents of our practical course program, including the exam, to video conferences and our university's digital platform. Students were asked to answer a questionnaire about the course afterward.

Purpose of the present study:

In this study,

- we explored whether it is possible to create an online course that teaches psychiatric history taking, examination, and communication to fourth year medical students.
- we compared whether the exam results of students who were taught exclusively online differ from those taught in our established on-site course.
- we investigated whether the teaching modalities had an impact on student satisfaction.
- we assessed how the online learning environment is accepted by both lecturers and students.

METHODS

Participants

Fourth-year medical students complete an obligatory 1-week practical course at our psychiatric clinic. In the winter semester of 2019/20, when the course was held on-site, we examined 156 students in an objective structured clinical examination (OSCE) of which 150 (return rate: 96% female: 87, male: 54, unknown: 9) participated in the questionnaire. For the online teaching summer semester of 2020, 175 students were examined and 156 (return rate: 89% female: 93, male: 65, unknown: 2) participated in the questionnaire.

Additionally, we questioned all 16 (return rate: 75%) lecturers teaching in the summer semester about their experiences. The lecturers were the same in the on-site and online semesters, with the exception of four lecturers due to clinical rotations.

The participating medical students and lecturers voluntarily agreed to participate in the survey. The students were explicitly informed that participation would not impact their exam grades and that the questionnaire answers and grades would be processed anonymously. This study was submitted to the ethical committee of the Friedrich-Alexander University Erlangen-Nuremberg and received a designation of exempt.

Course Concept

The practical education consists of 5 course days and the following OSCE. Each day includes a 45-min theoretical seminar about common psychiatric syndromes presented by one of our senior physicians. In previous semesters, two to three real and/or simulated patients were then interviewed by the students in groups of seven on the wards. During the online semester, we used conference calls, in which only simulated patients were available due to privacy protection concerns. The actors, lecturers, and students gave feedback based on their perception of the interview. We expanded the course in the digital setting by offering a 20-min group exercise every day. Additionally, we offered a quiz for self-testing and attached resources based on our online lecture content such as podcasts and reading material (5). After 1 week, one of four standardized patient cases was given to the students as an OSCE. In the summer semester of 2020, this OSCE was also carried out via video conference.

Simulated Patients

The pool of simulated patients includes 6 professional actors and 10 amateurs, with a mean of seven semesters of experience as a simulated patient (5 males, 11 females) and around 16 assignments in each semester. Roles played include dementia, delirium, schizophrenia, major depression, bipolar disorder, adaptive disorder, obsessive–compulsive disorder, anxiety disorder, sexual arousal disorder, and sexual dysfunction. They are regularly trained and supervised in their roles, as well as in giving feedback to the students.

Objective Structured Clinical Examination Testing

Simulated patients will perform one out of four clinical cases (dementia, schizophrenia, bipolar disorder (current depressive episode), obsessive–compulsive disorder). The examiners are not the same as the lecturers. To provide a fair exam, we use a standardized questionnaire, rating performance of communication models, medical thoroughness, and the following case presentation (**Supplementary Figure 1**). The time frame of the interview was 15 min plus 90-s patient presentation. We taught and examined two communication models: the WRMS model (Wait-Repeat-Mirror-Summarize), used to support active listening (10), and the more advanced NURSE model (Naming-Understanding-Respecting-Supporting-Exploring Emotions), aiding the use of emotions in communication (11). One of the four cases (major depression/bipolar disorder) included taking the sexual history of patients. The scores we compared can be seen in **Table 1**. The same OSCE has been performed in the last four semesters, showing no improvement of the overall results over time. This indicates that previous knowledge of the exam structure is not advantageous to the students' performance; rather, their actual subject knowledge is examined.

Questionnaire

The students answered the questionnaire following completion of the course and prior to the exam. We assessed 15 items, including interest, motivation, self-assessment, in-course feedback and overall enjoyment. The rating was based on German school grades [1 (totally agree) to 6 (totally disagree)]. The students' gender and individual study duration were collected as demographic data (**Supplementary Figure 2**).

Furthermore, students were asked to compare the online course with their previous on-site learning experience (better–same–worse). Lecturers were asked to compare the online course to the previous semesters (better–same–worse).

Digital Environment

We used Zoom (Zoom Version 5.0.2., Zoom Video Communications Inc., California, USA) as a platform for conducting video conferences.

TABLE 1 | OSCE performance scores: composition of the compared scores with exemplary tested items and achievable number of points.

Score	Exemplary items	Achievable points	Comment
Total score		60	Interview and patient presentation
WRMS	Applies the WRMS model	4	Wait-Repeat-Mirror-Summarize
NURSE	Applies the NURSE model	5	Naming-Understanding-Respecting-Supporting-Exploring Emotions
Psychopathological symptoms	Assesses orientation; asks for delusions; examines perception	16 (12 for the bipolar disorder case)	Included only the most relevant items for the case, not a complete assessment
Sexual history	Asks for sexual arousal disorders adequately; asks for sexual dysfunction adequately	4	Only assessed in the bipolar disorder case OSCE
Patient presentation	Describes current complaints proposes correct treatment attempt; keeps 90-s time limit	20	

Ilias StudOn (ILIAS Version 5.4.17, ILIAS open-source e-Learning e.V., Cologne, Germany) is the online e-learning system of the University of Erlangen-Nuremberg.

Data Analysis

Statistical analysis was performed using SPSS (SPSS 21, IBM, Armonk USA). We used hierarchic linear modeling (HLM 7, Scientific Software International, Inc., Skokie, USA). Level-1 variables describe data collected from a single student (gender, duration of study), while level-2 variables consider data collected in the same week (lecturer, simulated patients, examiner, OSCE case, online/on-site teaching) (12). Results of the hierarchic linear modeling are reported as the difference between slopes (b) of the regression curves and its significance (p).

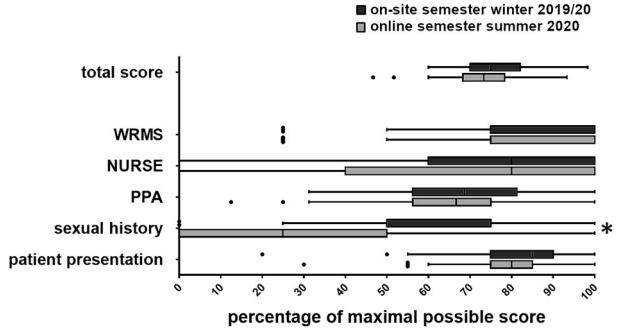

FIGURE 1 | Tukey plot of the OSCE results with sub scores (WRMS, Wait-Repeat-Mirror-Summarize-Model; NURSE, Naming-Understanding-Respecting-Supporting-Exploring-Emotions-Model; PPA, Psychopathological Assessment; Sexual history; Patient presentation). *$p < 0.05$.

RESULTS

The Test Results Did Not Differ Between Online and On-Site Learning

We compared the total number of points achieved in the OSCE as well as various sub-scores in the last on-site semester (winter semester 2019/20, $n = 150$) with those achieved in the e-learning semester (summer semester 2020, $n = 156$). The result of the power calculation indicated that with a total n of 306, small-to-medium effect sizes could be detected ($\rho = 0.185$). The intercept-only model revealed an ICC of 0.385. Thus, 38.5% of the variance in total exam score is between groups (including variables such as the semester, the lecturer, and the examiner) and 61.5% of the variance in the total exam score is between students (including variables such as age and duration of study) within a given group.

There was no significant difference in the total score ($b = -1.47$, $p = 0.127$), the communication scores (WRMS: $b = -0.12$, $p = 0.425$; NURSE: $b < -0.01$, $p = 0.991$), the psychopathological symptoms score ($b = -0.28$, $p = 0.561$), or the clinical presentation ($b = -0.39$, $p = 0.306$). However, there was a significant difference in the taking of the patient's sexual history ($b = -0.91$, $p = 0.011$), meaning that the students of the on-site semester performed better at this task than the students of the e-learning semester (**Figure 1**).

Gender Differences in the Objective Structured Clinical Examination Score

The students' gender significantly affected the exam results when including data from both semesters ($b = 1.57$, $p = 0.003$). In the subsequent analysis of the individual semesters, we discovered no significant relationship between gender and total score in the on-site semester ($b = 0.73$, $p = 0.290$), while there was a significant relationship between gender and total score in the online semester ($b = 2.43$, $p = 0.002$). Male students scored significantly fewer points in the online semester. We analyzed the relationship between gender and total score with consideration of the teaching method (online vs. on-site) as a potential moderator/mediator. In the analysis, we observed a difference between the estimation of fixed effects and the estimation of fixed effects with robust standard errors. Therefore, we decided to use the more conservative approach and report the results of the fixed effects with robust standard errors. There was a significant relationship between the method (online vs. on-site) and the total score ($b = -4.42$, $p = 0.023$), as well as a significant cross-level interaction between method and gender ($b = 1.90$, $p = 0.042$), whereas the relationship between gender and total score was

no longer significant ($b = 0.49$, $p = 0.495$). This suggests that the method (online vs. on-site) is a mediator in the relationship between gender and total score: there is no stand-alone effect of gender on the total score; the effect is completely mediated by the fact that male students had worse total scores only in the online course environment.

On-Site Learning Receives Better Rating in Student–Teacher Relationship Items and Structure

The return rate of the student questionnaire was 98% for the on-site winter semester ($n = 153$) and 89% for the online summer semester ($n = 156$).

During the on-site semester, the students rated the following items better: the subjective support they received from their lecturer ($b = 0.37$, $p = 0.017$, **Figure 2D**), how much their interest in psychiatry was increased by the lecturer ($b = 0.39$, $p = 0.030$, **Figure 2B**), how much they enjoyed the course ($b = 0.28$, $p = 0.031$, **Figure 2C**), as well as how they would grade the course overall ($b = 0.20$, $p = 0.034$, **Figure 2A**). However, as previously reported, these differences did not impact the exam grade.

With E-Learning, Students' Self-Assessment in Communication Is Higher

Contrarily, students' self-assessment in the online semester improved for three communication heavy skills: the use of the WRMS strategy ($b = -0.43$, $p = 0.002$, **Figure 2F**), the use of the NURSE strategy ($b = -0.61$, $p < 0.001$, **Figure 2G**), and their ability to take the sexual history of a patient ($b = -0.40$, $p = 0.035$, **Figure 2H**).

Acceptance and Preference

The questionnaire item "I think the structure of the course is suited to teaching psychiatric expertise" was rated better for the on-site semester ($b = 0.32$, $p = 0.003$, **Figure 2E**).

When asked to compare the online course with their previous on-site learning experience, 50.0% of the students of the summer semester preferred the on-site semester, 24.2% preferred online teaching, and 25.8% rated them equally ($n = 120$).

Lecturer feedback had a return rate of 75%. Seventy-five percent of the lecturers preferred the on-site semester, 8% preferred the online semester, and 17% rated them equally ($n = 12$).

DISCUSSION

Overall, we did not observe a difference in the exam scores between the on-site and the online semesters, except for the taking of the sexual history. The questionnaire showed that while students rated their own communication skills better in the online semester, they felt less connected to their lecturer.

It Is Possible to Create an Exclusively Digital Course

The existing digital structures were flexible enough in executing our plans to combine video conferences with online group work, as well as providing online materials for self-study. Zoom proved viable in imitating a telemedical setting. The online learning tool of the university, based on ILIAS, provided options to implement resources and assignments in a variety of media formats (weblinks, pictures, videos, podcasts, and texts), allowing for a more diverse learning experience. Students, lecturers, and actors had no issues using the platforms after an introduction. Technical problems did not occur on a relevant scale. Thus, the realization of the project did not meet many obstacles. As a result, the exam and questionnaire results were interesting to observe.

The Only Difference in the Test Results Was the Taking of the Sexual History When Comparing On-Site With Online Learning

The students' overall performance and the sub-scores were not relevantly impaired in the exclusive online teaching environment.

The only score that significantly changed was the taking of the sexual history. It is worth noting that this score is tested only in one-fourth of the exams (major depression/bipolar disorder). Wide fluctuations of this score have therefore also been observed in previous semesters. However, since sexual history often is a difficult topic to address (13), one could argue that the training lacked in thoroughness, the lecturers expressed more personal reservations in the online setting, or the online setting was indeed unsuitable in forming a dependable student–teacher relationship. Regarding the latter, Palmer et al. (14) created an online course to train students to interview patients about adverse sexual effects of SSRIs and observed positive communicative developments. This could indicate that the online setting itself is not at fault, rather, the degree to which our lecturers adapted the teaching of the sexual history taking to an online environment. We hypothesize that reservations (e.g., shame) regarding talking about sexuality may be harder to overcome in an online environment, and this impacted the quality of the teaching.

Overall, the results did not indicate a difference in the general student performance, thus, suggesting that the transfer of our course to an online setting did not have a considerable impact on the learning effectiveness.

Several authors studying the quality and practicability of online medical teaching reported similar findings. There is a wide range of methods described by the term "web-based learning," complicating the navigation of literature (15). Our study included multiple such approaches, which were mostly tested as a stand-alone intervention. There are several findings that video lectures and live lectures are equally effective in teaching new content (1, 16, 17). Providing digital content, in addition to lectures and simulated patient interviews, is a useful tool to promote deep learning (18, 19). Topic-focused interventions can improve specific skills, such as taking the patient's sexual history (20, 21). The core of our course is the training of communication skills. Kaltman et al. (22) found that students trained with interactive online videos demonstrated more of the taught patient-centered

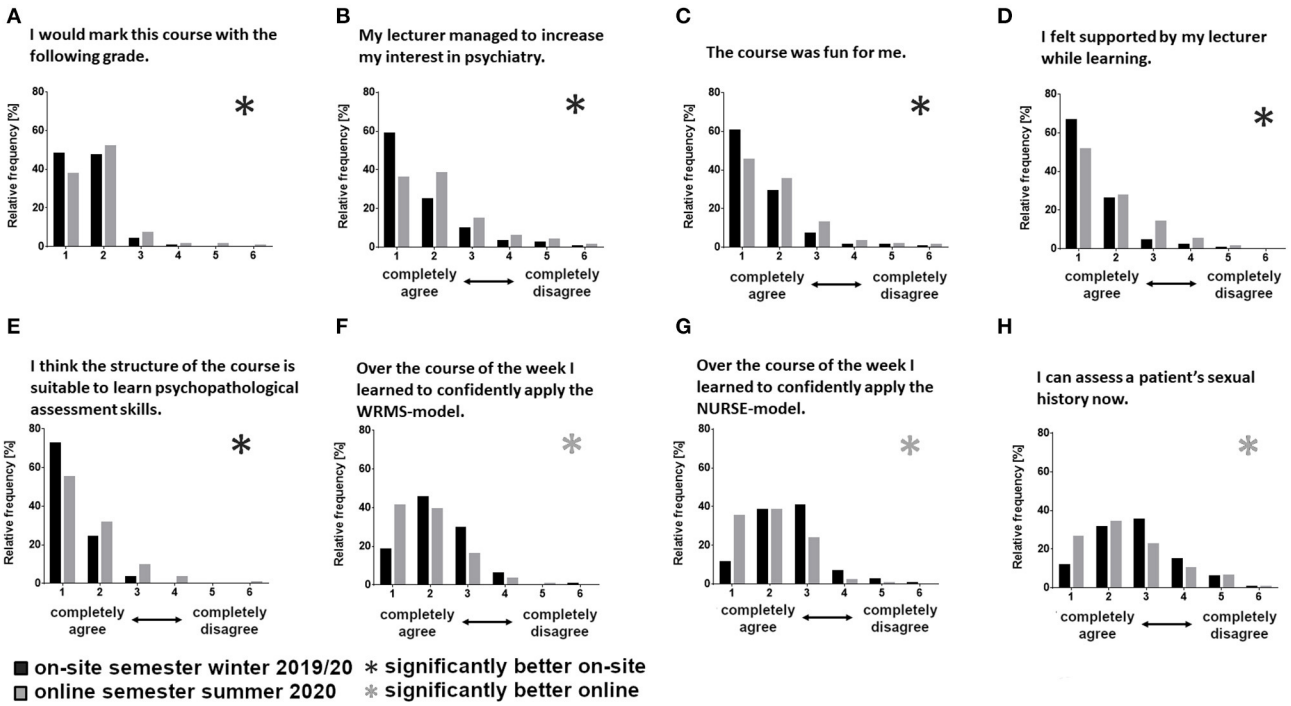

FIGURE 2 | Distribution of questionnaire ratings sorted by item **(A–H)**, comparing between the semesters (winter semester 2019/20, $n = 150$; summer semester 2020, $n = 156$) using hierarchic linear modeling (*significant differences between the semesters; WRMS, Wait-Repeat-Mirror-Summarize-Model; NURSE, Naming-Understanding-Respecting-Supporting-Exploring-Emotions-Model).

interview skills in a face-to-face. The usefulness of simulations in medical education has been long since established (23). Parisi et al. used an approach using Zoom in small groups with simulated patients with diabetes, similarly to our study. They found it to be effective as well, but emphasized the lack of non-verbal communication training, which is especially important in intercultural contexts (24). Mohos et al. found the transfer of their course to an online environment to be a success, with consistent outcomes compared with previous semesters. Nevertheless, they raised concerns considering the missing personal contact (25), which we came across as well.

The Subjective Learning Experience Seems to Differ Between Online and On-Site Teaching

The students evaluated the on-site semester better in student–teacher-related items (subjective support from the teacher, increased interest in psychiatry, and overall enjoyment), as well as the course as a whole. This may indicate that the establishment of face-to-face contact with the lecturer plays a significant role in the perception of the experience as pleasant and helpful (26). As the participants' satisfaction influences the success of a didactic method (on-site/online), it may be considered that while the exam results stayed the same, the course did not entirely meet its standards (27). Thus, it should be aimed to include elements in online courses in which space for such interaction is provided (28). For example, an introductory round at the start of the week, as well as daily flash feedback rounds could be included to promote group synergy. More time for discussion of the topic could further improve this. With respect to the structure of the course, we repeatedly received verbal feedback emphasizing that it is preferable if the lecturer does not switch during the week.

In the online semester, the students self-assessed their communication skills (WRMS, NURSE, and SEX) better. It is notable that only the communication strategies but no other learning content, such as the examination of symptoms or the clinical presentation, were rated differently. This may have various reasons. The simulated patients may have been primed to react to these communication models in a more obvious way. It is also possible that without proper non-verbal communication, the students had to rely on the learned strategies or could better focus on the patient's reaction. Perhaps the lowered social anxiety allowed for bolder self-assessment. Special consideration should be given to the self-assessment of summer students, who rated their sexual history taking skills higher than the previous semester but achieved lower scores in their exams. This may indicate that the self-assessment of students, at least in the form tested in this study, is not reliable when compared with the results of an OSCE (29).

Differences Regarding Gender

The method (online vs. on-site) is a mediator in the relationship between gender and total score. We found that female students reached a significantly higher average total score in the online semester. We cannot conclude whether this is because female students performed better during the online semester or if

male students struggled more, neither whether it was directly caused by our e-learning method or surrounding circumstances. González-Gómez et al. (30) found that female students were more accepting of e-learning, which might be the reason for their better performance in the OSCE during the online semester. Thus, gender differences should be considered when investigating e-learning in educational research, as findings similar to ours have been reported before (31, 32).

Students' and Lecturers' Reservations Toward E-Learning Are to Be Considered

We also observed that the majority of students (50%) and lecturers (75%) of the summer semester preferred on-site teaching. Students also thought that the structure of the on-site course is more suited to teach psychiatric expertise.

Mullins et al. (33) also found that students preferred on-site psychiatric lectures, even though they liked the flexibility and availability of online lectures. While there is still a preference for traditional teaching methods, the acceptance of online teaching methods is increasing, and participants adapt well when confronted with them (34, 35). Nevertheless, the lecturers' willingness and trust in the teaching method has a relevant role in its proper implementation (9).

Limitations and Further Research

The power analysis showed that we had a sufficient number of participants, but it should be considered that the summer semester of 2020, at the time of our intervention, was also severely influenced by the COVID-19 pandemic, which may have had a number of unforeseen effects on our results (36–39). Also, our groups where not randomized or controlled (40).

The OSCE testing we performed has been validated throughout the previous four semesters and has proved reliable. However, it cannot be excluded that conducting the exam online has an effect on the examiner that mingles with the influences of our intervention.

A general problem is that the variance of the lecturer, student, and examiner has a significant impact on the outcome of learning and exam results. The influence of the teaching method we investigated may be overshadowed by these variables.

CONCLUSION

Overall, we can conclude that a practical course in psychiatry can be conducted in an online setting with video conferences. The exam grades did not differ in comparison to on-site teaching. Items illustrating the student–teacher relationship were rated better when teaching in person, indicating that this is an issue to be considered in future studies.

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 participating medical students and lecturers voluntarily agreed to participate in the survey. The participation did not impact the exam grades, and the questionnaire answers and grade were processed anonymously. This study was submitted to the ethical committee of the Friedrich Alexander Universität Erlangen-Nuremberg and received a designation of exempt.

AUTHOR CONTRIBUTIONS

CR, JU, MR, JK, and PS designed the study. CR, JU, and PS collected the data. Data were analyzed and evaluated by CR, JU, MR, JK, and PS. The statistics were carried out by CR and MR. CR, JU, MR, and PS drafted the manuscript. All authors critically reviewed the manuscript and provided constructive comments to improve the quality of the manuscript. All authors have read and approved the final manuscript. All authors agree to be accountable for all aspects of the work.

ACKNOWLEDGMENTS

The present work was performed in partial fulfillment of the requirements for obtaining the degree Dr. med. of CR. We gratefully thank Martina Manna for the language editing. We acknowledge support from Deutsche Forschungsgemeinschaft (DFG) and Friedrich-Alexander-University Erlangen-Nuremberg (FAU) within the funding program Open Access Publishing.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.624005/full#supplementary-material

REFERENCES

1. Pei L, Wu H. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Med Educ Online.* (2019) 24:1666538. doi: 10.1080/10872981.2019.1666538
2. Richmond H, Copsey B, Hall AM, Davies D, Lamb SE. A systematic review and meta-analysis of online versus alternative methods for training licensed health care professionals to deliver clinical interventions. *BMC Med Educ.* (2017) 17:227. doi: 10.1186/s12909-017-1047-4
3. McCutcheon K, Lohan M, Traynor M, Martin D. A systematic review evaluating the impact of online or blended learning vs. face-to-face learning of clinical skills in undergraduate nurse education. *J Adv Nurs.* (2015) 71:255–70. doi: 10.1111/jan.12509
4. Duffy FD, Gordon GH, Whelan G, Cole-Kelly K, Frankel R, Buffone N, et al. Assessing competence in communication and interpersonal skills: the Kalamazoo II report. *Acad Med.* (2004) 79:495–507. doi: 10.1097/00001888-200406000-00002
5. Reed S, Shell R, Kassis K, Tartaglia K, Wallihan R, Smith K, et al. Applying adult learning practices in medical education. *Curr Probl Pediatr Adolesc Health Care.* (2014) 44:170–81. doi: 10.1016/j.cppeds.2014.01.008
6. Wündrich M, Peters J, Philipsen A, Kopasz M, Berger M, Voderholzer U. Einsatz von Simulationspatienten in den Lehrfächern Psychiatrie und

Psychotherapie. Eine kontrollierte Pilotstudie. *Nervenarzt.* (2008) 79:1273–82. doi: 10.1007/s00115-008-2493-3
7. Park KH, Park SG. The effect of communication training using standardized patients on nonverbal behaviors in medical students. *Korean J Med Educ.* (2018) 30:153–9. doi: 10.3946/kjme.2018.90
8. Link TM, Marz R. Computer literacy and attitudes towards e-learning among first year medical students. *BMC Med Educ.* (2006) 6:34. doi: 10.1186/1472-6920-6-34
9. O'Doherty D, Dromey M, Lougheed J, Hannigan A, Last J, McGrath D. Barriers and solutions to online learning in medical education - an integrative review. *BMC Med Educ.* (2018) 18:130. doi: 10.1186/s12909-018-1240-0
10. Langewitz W, Laederach K, Buddeberg C. Ärztliche Gesprächsführung. In: Buddeberg C, editor. *Psychosoziale Medizin*. Berlin: Springer (2004). p. 373–407.
11. Back AL, Arnold RM, Baile WF, Fryer-Edwards KA, Alexander SC, Barley GE, et al. Efficacy of communication skills training for giving bad news and discussing transitions to palliative care. *Arch Intern Med.* (2007) 167:453–60. doi: 10.1001/archinte.167.5.453
12. Woltman H, Feldstain A, MacKay JC, Rocchi M. An introduction to hierarchical linear modeling. *Tutor Quant Methods.* (2012) 8:52–69. doi: 10.20982/tqmp.08.1.p052
13. Forsyth S, Rogstad K. Sexual health issues in adolescents and young adults. *Clin Med (Lond).* (2015) 15:447–51. doi: 10.7861/clinmedicine.15-5-447
14. Palmer BA, Lee JH, Somers KJ, Swintak CC, Rullo J, Bright RP, et al. Effect of in-class vs. online education on sexual health communication skills in first-year medical students: a pilot study. *Acad Psychiatry.* (2019) 43:175–9. doi: 10.1007/s40596-018-0949-8
15. Cook DA, Garside S, Levinson AJ, Dupras DM, Montori VM. What do we mean by web-based learning? A systematic review of the variability of interventions. *Med Educ.* (2010) 44:765–74. doi: 10.1111/j.1365-2923.2010.03723.x
16. Brockfeld T, Müller B, de Laffolie J. Video versus live lecture courses: a comparative evaluation of lecture types and results. *Med Educ Online.* (2018) 23:1555434. doi: 10.1080/10872981.2018.1555434
17. Solomon DJ, Ferenchick GS, Laird-Fick HS, Kavanaugh K. A randomized trial comparing digital and live lecture formats ISRCTN40455708. *BMC Med Educ.* (2004) 4:27. doi: 10.1186/1472-6920-4-27
18. Warren N, Parker S, Khoo T, Cabral S, Turner J. Challenges and solutions when developing online interactive psychiatric education. *Australas Psychiatry.* (2020) 28:359–62. doi: 10.1177/1039856220901477
19. Ryznar E, Hamaoka D, Lloyd RB. Pilot study of an online self-directed learning module for medical decision-making capacity. *Acad Psychiatry.* (2020) 44:408–12. doi: 10.1007/s40596-020-01215-y
20. Wasser TD, Hu J, Danzig A, Yarnell-MacGrory S, Guzman JR, Michaelsen K. Teaching forensic concepts to residents using interactive online modules. *J Am Acad Psychiatry Law.* (2020) 48:77–83. doi: 10.29158/JAAPL.003890-20
21. Tessler Lindau S, Goodrich KG, Leitsch SA, Cook S. Sex in the curriculum: the effect of a multi-modal sexual history-taking module on medical student skills. *Sex Educ.* (2008) 8:1–9. doi: 10.1080/14681810701811753
22. Kaltman S, Talisman N, Pennestri S, Syverson E, Arthur P, Vovides Y. Using Technology to enhance teaching of patient-centered interviewing for early medical students. *Simul Healthc.* (2018) 13:188–94. doi: 10.1097/SIH.0000000000000304
23. Issenberg SB, McGaghie WC, Petrusa ER, Lee Gordon D, Scalese RJ. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med Teach.* (2005) 27:10–28. doi: 10.1080/01421590500046924
24. Parisi MC, Frutuoso L, Benevides SS, Barreira NH, Silva JL, Pereira MC, et al. The challenges and benefits of online teaching about diabetes during the COVID-19 pandemic. *Diabetes Metab Syndr.* (2020) 14:575–6. doi: 10.1016/j.dsx.2020.04.043
25. Mohos A, Mester L, Barabás K, Nagyvári P, Kelemen O. Orvos-beteg kommunikációs gyakorlat szimulált pácienssel a koronavírus-járvány idején. (A COVID-19-pandémia orvosszakmai kérdései). *Orv Hetil.* (2020) 161:1355–62. doi: 10.1556/650.2020.31930
26. Alnabelsi T, Al-Hussaini A, Owens D. Comparison of traditional face-to-face teaching with synchronous e-learning in otolaryngology emergencies teaching to medical undergraduates: a randomised controlled trial. *Eur Arch Otorhinolaryngol.* (2015) 272:759–63. doi: 10.1007/s00405-014-3326-6
27. Haidet P, Stein HF. The role of the student-teacher relationship in the formation of physicians. The hidden curriculum as process. *J Gen Intern Med.* (2006) 21(Suppl 1):S16–20. doi: 10.1111/j.1525-1497.2006.00304.x
28. KerŽič D, TomaŽevič N, Aristovnik A, Umek L. Exploring critical factors of the perceived usefulness of blended learning for higher education students. *PLoS One.* (2019) 14:e0223767. doi: 10.1371/journal.pone.0223767
29. Pawluk SA, Zolezzi M, Rainkie D. Comparing student self-assessments of global communication with trained faculty and standardized patient assessments. *Curr Pharm Teach Learn.* (2018) 10:779–84. doi: 10.1016/j.cptl.2018.03.012
30. González-Gómez F, Guardiola J, Martín Rodríguez Ó, Montero Alonso MÁ. Gender differences in e-learning satisfaction. *Comput Educ.* (2012) 58:283–90. doi: 10.1016/j.compedu.2011.08.017
31. Ramírez-Correa PE, Arenas-Gaitán J, Rondán-Cataluña FJ. Gender and acceptance of E-learning: a multi-group analysis based on a structural equation model among college students in Chile and Spain. *PLoS One.* (2015) 10:e0140460. doi: 10.1371/journal.pone.0140460
32. Wijaya TT, Ying Z, Suan L. Gender and self regulated learning during COVID-19 pandemic in Indonesia. *Basicedu.* (2020) 4:725–32. doi: 10.31004/basicedu.v4i3.422
33. Mullins D, Jabbar F, Fenlon N, Murphy KC. The digital age: is this the future of medical education? A cross-sectional study to assess medical students' opinions about e-learning in psychiatry undergraduate medical education. *Ir J Psychol Med.* (2014) 31:89–96. doi: 10.1017/ipm.2014.15
34. Gormley GJ, Collins K, Boohan M, Bickle IC, Stevenson M. Is there a place for e-learning in clinical skills? A survey of undergraduate medical students' experiences and attitudes. *Med Teach.* (2009) 31:e6–12. doi: 10.1080/01421590802334317
35. Wynter L, Burgess A, Kalman E, Heron JE, Bleasel J. Medical students: what educational resources are they using? *BMC Med Educ.* (2019) 19:36. doi: 10.1186/s12909-019-1462-9
36. Looi JC, Bonner D, Maguire P, Finlay A, Keightley P, Parige R, et al. Flattening the curve of COVID-19 for medical education in psychiatry and addiction medicine. *Australas Psychiatry.* (2020) 29:31–4. doi: 10.1177/1039856220946647
37. Hodges C, Moore S, Lockee B, Trust T, Bond A. *The Difference Between Emergency Remote Teaching and Online Learning.* (2020). Available online at: https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning (cited October 02, 2020).
38. Horesh D, Kapel Lev-Ari R, Hasson-Ohayon I. Risk factors for psychological distress during the COVID-19 pandemic in Israel: loneliness, age, gender, and health status play an important role. *Br J Health Psychol.* (2020) 25:925–33. doi: 10.1111/bjhp.12455
39. Conversano C, Di Giuseppe M, Miccoli M, Ciacchini R, Gemignani A, Orrù G. Mindfulness, age and gender as protective factors against psychological distress during COVID-19 pandemic. *Front Psychol.* (2020) 11:1900. doi: 10.3389/fpsyg.2020.01900
40. Sinclair P, Kable A, Levett-Jones T. The effectiveness of internet-based e-learning on clinician behavior and patient outcomes: a systematic review protocol. *JBI Database Syst Rev Implement Rep.* (2015) 13:52–64. doi: 10.11124/jbisrir-2015-1919

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

frontiers in Psychiatry

CASE REPORT
published: 20 April 2021
doi: 10.3389/fpsyt.2021.650317

Case Report: Defining Applicant Attributes to Be Prioritized in the Selection of Child and Adolescent Psychiatry Subspecialty Residents at the University of Toronto

Chetana A. Kulkarni[1,2]*, *Raj Rasasingham*[1,3†], *Nicole N. Woods*[4†], *Daniel A. Gorman*[1,2†], *Peter Szatmari*[1,2,5†] *and Mark D. Hanson*[1,2]

[1] Department of Psychiatry, University of Toronto, Toronto, ON, Canada, [2] Department of Psychiatry, Hospital for Sick Children (SickKids), University of Toronto, Toronto, ON, Canada, [3] Humber River Regional Hospital, Toronto, ON, Canada, [4] The Wilson Centre, University Health Network, Toronto, ON, Canada, [5] Centre for Addiction & Mental Health, Toronto, ON, Canada

OPEN ACCESS

Edited by:
Robbert Duvivier,
Parnassia Psychiatric Institute, Netherlands

Reviewed by:
Elizabeth Barrett,
University College Dublin, Ireland
Jeffrey I. Hunt,
Brown University, United States

***Correspondence:**
Chetana A. Kulkarni
chetana.kulkarni@sickkids.ca

[†] These authors have contributed equally to this work as collaborative authors

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: 06 January 2021
Accepted: 25 March 2021
Published: 20 April 2021

Citation:
Kulkarni CA, Rasasingham R, Woods NN, Gorman DA, Szatmari P and Hanson MD (2021) Case Report: Defining Applicant Attributes to Be Prioritized in the Selection of Child and Adolescent Psychiatry Subspecialty Residents at the University of Toronto. Front. Psychiatry 12:650317. doi: 10.3389/fpsyt.2021.650317

Background/Objectives: The child and adolescent psychiatry (CAP) subspecialty training program at the University of Toronto was among the first fully accredited CAP programs in Canada. As one of Canada's largest CAP subspecialty programs, we attract many excellent applicants annually. While objectivity and transparency in the selection of candidates have been valued, it was unclear which applicant attributes should be prioritized. This quality improvement project was undertaken to identify the key applicant attributes that should be prioritized for admission to the program.

Materials/Methods: An initial list of attributes was compiled by project team members and feedback solicited. Through iterative design, this list was categorized into "end products," "branding attributes" and "generic attributes." The "end products" were removed as these represented outputs of training rather than attributes on which applicant selection should be based. Subsequent steps involved only the "branding" and "generic" attributes. A consensus-building exercise led to the creation of two short-lists of five attributes within each category. Finally, a paired-comparison forced choice methodology was used to determine the ranking of these attributes in order of importance when assessing applicants.

Results: The final lists of "generic" and "branding" attributes developed through a consensus-building exercise are presented in rank order based on the paired-comparison methodology. The overall response rate for the forced choice electronic survey was 49% of faculty and learners.

Conclusions/Discussion: This project used an iterative process of consensus building & pairwise comparison to prioritize key attributes for assessing trainee selection to the program. Going forward, these attributes will be incorporated into the file review and interview portions of our admissions process. In addition to emphasizing these priority

attributes in admissions, there are implications for other aspects of the program including curriculum and faculty development, as well as guiding the overall mission and vision for the Division. A similar process could be undertaken by other training programs seeking to identify priority attributes for admission to their programs.

Keywords: medical education, psychiatry, attributes, admissions, selection, child and adolescent psychiatry

INTRODUCTION

Canadian child and adolescent psychiatry (CAP) subspecialty training constitutes a 2-year program with entry during the final year of a 5-year general psychiatry training program, for a total of 6 years of training following graduation from medical school. In 2012, the CAP subspecialty program at the University of Toronto (UT) was among the first to become a Royal College of Physicians and Surgeons of Canada (RCPSC) accredited training program. A total of 16 CAP programs have since been established and accredited across the country. There is a non-centralized application process, although, programs collaborate to determine shared timelines for application deadlines, interviews and offers. Each program admits one to seven applicants per year. The UT CAP program has been competitive, attracting as many as 15 applicants for 3–5 positions in the program. All applicants are typically highly accomplished and motivated residents. However, their career trajectories are often quite varied and residents enter the program with an array of strengths and interests. In the early days of the program, residents were selected based on a review of their application file (consisting of their CV, reference letters, and a personal statement) and two in-person semi-structured interviews. Although, there were 10 selection criteria, none of these was explicitly prioritized over the others, and thus they were subject to individual interpretation and implicit bias by file reviewers and interviewers. Moreover, these 10 criteria were identified by the selection committee without broader input from other stakeholders.

With increasing recognition of the importance of transparency and objectivity in the selection process (1), as well as a wish to attract diverse applicants from across Canada, in 2016 the Head of the Division of Child & Youth Mental Health (DCYMH) tasked the resident selection committee with modernizing their selection process by applying emerging best practices in selection, including: independent sampling, competency definition, multiple interviews, and relative ranking of candidates (2–4). The first step was to undertake a process of identifying the key applicant attributes to be considered in CAP trainee selection. The goals of this attribute identification quality-improvement (QI) exercise were 4-fold; (1) identification of an explicit set of attributes for use in the new selection protocol, (2) explicit descriptions of desired UT CAP applicant profiles, (3) mitigating sources of potential bias in the admissions process, and (4) distinguishing our program from others across the country, thus, distinctly positioning the UT CAP training program within the competitive national CAP training landscape (which we refer to as *branding*). Shappell and colleagues (5) define brand identity for postgraduate training programs as a "set of associations that defines a program, differentiates it from others in the specialty, and makes it relevant to specific target groups." Although branding is often seen as a marketing goal, we also view it as a quality goal in order to develop overarching educational consistency across the many UT CAP teaching sites. Renewal of the CAP subspecialty selection process was seen to be an integral component of defining and establishing the UT CAP brand identity, thus, differentiating the UT CAP training program from others across the country (6) and fostering applicant's self-selection of the program. By defining key attributes and then incorporating them into the admissions process, we also sought to mitigate some sources of bias in the admissions process (7). Further, the identified priority attributes for resident selection would guide future CAP residency curriculum renewal to bring alignment across UT CAP selection and curriculum practices and ultimately the vision and mission for the DCYMH.

METHODS

Phase 1: Consensus Building

Overall, an iterative design process was undertaken for this project. An initial list of potential attributes (e.g., leadership, scholarship, clinical skills, advocacy) was compiled during a brainstorming exercise led by project team members with the Executive of the DCYMH, at a half-day meeting dedicated to this purpose in March 2016. In June 2016, the project and goals were introduced to Divisional faculty and learners who attended the Divisional retreat. This event occurs annually and is attended by faculty and learners from the Division as an opportunity to reflect on and celebrate the previous academic year and plan for the year ahead. Educational theories, emerging concepts in medical education and evidence related to established best practices in selection processes were summarized for participants (2–4, 7–9). Following these didactic sessions, participants gathered in small groups to discuss the initial list of priority attributes and brainstorm further ideas. Over the summer & fall of 2016, further feedback was solicited from the DCYMH Residency Program Committee (RPC) and from key informants and stakeholders from within the DCYMH and the Department of Psychiatry. Subsequently, the project team reviewed the feedback that was gathered and identified eleven "branding attributes," ten "generic attributes," and seven "end products." The team determined that the "end products" category could be eliminated for the purposes of this project, as these would be outputs of the training process rather than attributes to be assessed

for selection into the program. Examples of "end products" included: academic psychiatrist, community-based psychiatrist, and researcher. "Branding attributes" were viewed as attributes that would contribute to brand identity (5), while "generic attributes" were defined as attributes that would be important for successful applicants to possess, but would not be specific to brand identity.

In order to further streamline attribute lists as well as maximize input and consensus regarding these lists, the project team undertook a consensus building exercise at the 2017 Divisional retreat. At that retreat, the selection committee's plan to move from two semi-structured interviews to four attributes-based Modified Personal Interviews (MPI) (3, 4) was summarized. It was reviewed that the priority attributes would serve as the criteria being assessed for resident selection, based on the file review and MPIs. A consensus-building activity was undertaken to determine the final list of attributes. For this activity, participants were divided into three groups and each group was provided with the lists of these words are an error eleven "branding attributes" and ten "generic attributes." Each group was tasked with choosing their top five priority attributes from each list. To enhance engagement, the groups were given the freedom to determine how they achieved consensus. Each group then presented their lists and discussed why they chose to prioritize those specific attributes. As the groups presented their lists it became evident that there was already a great deal of overlap and consensus between the lists. Following each group's presentation and discussion of the notable commonalities and differences, participants were asked to anonymously vote on their preferred panels of attributes, resulting in the final panels of attributes chosen by vote (**Table 1**).

Phase 2: Ranking of Priority Attributes

The second phase of this project involved ranking in order of importance, via forced choice pairwise comparison (10), the attributes developed in Phase 1. For each of the attribute categories, respondents were randomly presented with each attribute pairing and were forced to choose one attribute from each pairing. The final rank order list of attributes was developed based on the number of times each attribute was chosen through all of the pairings. This pairwise comparison was completed electronically by members of the DCYMH following the 2017 retreat. As a means of increasing participation, project team members (CAK & MDH) visited eight of eleven Divisional teaching sites (hospitals and community mental health centres) to discuss the project at local medical staff meetings. These site visits provided further opportunity to discuss the overall goals of the project and to answer questions. Participants in the meeting were shown how to access the pairwise comparison survey and were encouraged to complete it following the meeting. A similar meeting was held with trainees enrolled in the UT CAP subspecialty training program. The pairwise comparison survey was also distributed electronically to members of the DCYMH so that it could be completed by anyone who was not in attendance at the informational sessions.

RESULTS

Phase 1

With respect to the "generic attributes" lists, there was consensus among the groups at the Divisional retreat regarding the following attributes: Integrity/Ethics/Morality, Reflective practitioner, Evidence informed/Critical thinker, and Compassionate clinician. As such, a decision was needed only for the fifth attribute, with the options being Interprofessional, Collaborator, or Culturally Component. For the "branding attributes" lists there were three common attributes across all groups: Scholarly/scholarship, Advocate, and Leadership/Capacity for leadership. There was also agreement between two out of three groups for each of the remaining attributes. Consequently, there were only three attributes remaining from which the final two needed to be selected: Clinical strength/expertise, Capacity builder, and Innovator. Thus, the voting for the final panels of attributes only required choosing one final "generic" and two final "branding" attributes. The final lists of attributes determined through this process are presented in **Table 1**.

Phase 2

The two lists of five attributes identified in Phase 1 were then ranked in order of importance using a paired-comparison forced choice survey. Half of the Divisional faculty and 40% of residents participated in the survey (**Table 2**). Of the faculty who responded, 61.6% identified as being based at an academic hospital site, while 34.2% identified as being based at a community-based site (16.4% community hospital, 17.8% children's mental health agency).

We report the results of the forced choice pairwise comparison for both the generic attributes (**Table 3**) and the branding attributes (**Table 4**). Of the generic attributes, integrity/ethics/morality (Attribute A in **Table 3**) was chosen the most frequently in each pairing. Similarly, clinical strength/expertise (Attribute I in **Table 4**) was the most frequently chosen in each pairing of the branding attributes.

TABLE 1 | Final lists of attributes chosen following consensus-building activity.

Generic attributes	Branding attributes
Integrity/ethics/morality	Scholarly/scholarship
Reflective practitioner	Advocate
Evidence informed/critical thinker	Leadership/capacity for leadership
Compassionate clinician	Clinical strength/expertise
Culturally competent	Capacity builder

TABLE 2 | Survey response rates.

Respondent category	Number of respondents	Response rate
DCYMH Faculty	73/145	50.3%
Current CAP trainees	4/10	40.0%
Total	77/155	49.7%

The forced choice pairwise comparison results were used to develop the final rank ordering for each list of attributes, which are presented in **Table 5**.

DISCUSSION/CONCLUSIONS

We used an interactive consensus building approach to develop a list of key applicant attributes, and then a pair-wise comparison approach to rank these attributes for use in resident selection. This project has shown that such an approach is feasible, thus allowing for collaborative co-construction of priority attributes. These priority attributes can now be used to transparently describe desired applicant profiles, thus achieving the primary goals of this project. Information about attributes being sought can be listed in recruitment materials, including the program webpage, and incorporated into the admissions process. Some attributes may be best suited for assessment via file review, some through interview, and some through both processes. Assessment of attributes will need to be operationalized so they can be assessed when reviewing files and/or through interviews (e.g., each interview focusing on a subset of the attributes). Although, the attributes may be perceived as subjective, the interview allows for focus on applicant experiences that reflect these attributes in the delivery of mental health care for children, youth, and their families. By developing transparent criteria that can be used across the selection process, we can mitigate potential sources of bias (11, 12), an additional goal of this project. Previously different file reviewers/interviewers may have implicitly prioritized different attributes, leading to variability between assessors and across years. With transparent lists of priority attributes constituting preferred applicant profiles, admissions assessments are based explicitly on commonly valued and defined criteria (2, 8), rather than the unperceived values and biases of individual assessors.

The final goal of this project was to distinctly position as a brand the UT CAP training within the competitive national CAP training landscape. Rather than a top-down approach dictated by a few individuals, the involvement of members of the entire Division in developing these attributes was a critical aspect in gathering input that accounts for the organizational culture and wishes of its members (6). There is no national centralized system for admissions across the 16 Canadian CAP programs.

TABLE 3 | Pairwise comparison results for "generic attributes."

		A	B	C	D	E
Integrity/ethics/morality	A	-	A 68.83%	A 68.83%	A 53.25%	A 88.31%
Reflective practitioner	B	-	-	C 55.84%	D 61.04%	B 83.12%
Evidence informed/critical thinker	C	-	-	-	C 51.95%	C 81.82%
Compassionate clinician	D	-	-	-	-	D 85.71%
Culturally competent	E	-	-	-	-	-

Respondents were forced to choose between each pairing. The number seen is the percentage of respondents who chose the attribute listed from the pairing. (e.g., in the pairing integrity/ethics/morality vs. reflective practitioner or A vs. B, 68.83% of respondents chose integrity/ethics/morality or A.).

TABLE 4 | Pairwise comparison results for "branding attributes."

		F	G	H	I	J
Scholarly/scholarship	F	-	F 50.65%	H 54.55%	I 83.12%	J 50.65%
Advocate	G	-	-	H 55.84%	I 85.71%	J 57.14%
Leadership/capacity for leadership	H	-	-	-	I 80.52%	H 51.95%
Clinical strength/expertise	I	-	-	-	-	I 78.95%
Capacity builder	J	-	-	-	-	-

Respondents were forced to choose between each pairing. The number seen is the percentage of respondents who chose the attribute listed from the pairing. (e.g., in the pairing scholarly/scholarship vs. advocate or F vs. G, 50.65% of respondents chose scholarly/scholarship or F.).

TABLE 5 | Results of pairwise comparison – relative rankings.

Relative ranking	Generic attributes	Branding attributes
1.	Integrity/ethics/morality	Clinical strength/expertise
2.	Evidence informed/critical thinker	Leadership/capacity for leadership
3.	Compassionate clinician	Capacity builder
4.	Reflective practitioner	Scholarly/scholarship
5.	Culturally competent	Advocate

By explicitly defining the attributes being sought in incoming UT CAP residents, we are paving the way toward the development of an explicit brand that differentiates the UT CAP program from other CAP programs across the county. We acknowledge that other programs may seek overlapping qualities in their applicants; however, we are the first CAP program in Canada to explicitly identify and recruit for specific attributes. In doing so, the program stands out as one that is interested in recruiting from the national candidate pool and not solely from the local pool of potential candidates. From the applicant perspective, future applicants can be clear about the priorities of the program, thus allowing them to make informed decisions about applying to and accepting a position in the program. Given the high number of applicants for limited positions, this opportunity to ensure fit is particularly important.

Interestingly, the attribute of "clinical strength/expertise" was labeled by participants as a branding attribute. Later discussions by the project team led to the realization that perhaps this attribute should have been considered a generic attribute, as all training programs would intend to train excellent clinicians and so this attribute does not necessarily contribute to brand identity *per se*. Given UT's history as an institution with a significant research focus, it was somewhat surprising that scholarship was ranked fourth out of the five branding attributes, as it might have been anticipated to be more highly ranked. We note that we strove to involve respondents from a variety of Divisional sites, including affiliated community-based sites, which may explain the relative value placed on clinical abilities over scholarship in this iteration of the ranking. This serves as a lesson for those considering a brand development process that is collaborative and influenced by organizational culture – that it is important to gather a wide range of opinions and use established methodology such as a paired comparison to develop the actionable brand. Finally, the idea of leadership ranking so highly was initially questioned by some faculty members, who were concerned that selecting for future leaders would result in narrowing applicants to those with administrative or academic leadership aspirations. However, we would argue that the operationalization of leadership can and should be sufficiently broad as to enhance diversity and richness by selecting applicants who have the potential for formal and informal leadership in a wide variety of spheres including, but not limited to, research, advocacy, systems change, education, and equity. We anticipate that many graduates may not end up in formal leadership roles, but will still benefit from leadership skills that they can apply within their practices and the health care system.

The lists of attributes we identified will have broader impacts beyond trainee selection. In addition to selecting trainees who are already strong in these priority attributes, the program will emphasize these attributes in the curriculum, thus moving toward brand implementation (5). As such, going forward there will be a need for both curricular renewal and faculty development in relation to the identified attributes. Moreover, the attributes reflect the co-constructed priorities of the current faculty and learners in the Division. The attributes have since been incorporated into the Division's mission & vision statement that are articulated on the Divisional website, thus highlighting both internally and externally their value to the leadership and contributing to brand image (5).

Although, this project allowed for a great deal of collaboration and consensus building within the DCYMH, including physician and non-physician members, one potential limitation is that it did not involve individuals from outside the Division. It would have been valuable to include voices from within the broader Department of Psychiatry or the Faculty of Medicine. Incorporating viewpoints of persons with lived experience in defining the attributes that they would expect in future child and adolescent psychiatrists is also important. In future iterations of this project, it would add value to expand the collaborative process to include key stakeholders, such as family advocates and persons with lived experience, to further enhance the applicability of this work.

The collaborative consensus building approach that we undertook to develop our priority attributes can be applied and modified as needed at other institutions. As the project was conducted with minimal budget and resources, many other institutions should be able to replicate it. As the program's brand continues to develop, this work should be considered the first part of an iterative process that is repeated over time as priorities evolve. Future directions include operationalizing the attributes as they are applied to the admissions process, as well as measuring the reliability of assessing them. Input from residents and eventually from graduates will be valuable in understanding the influence of the attributes on how applicants view our program and the experience of residents trained in it.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements. The REB at the University of Toronto deemed this project a Quality Improvement (QI) project not requiring formal REB review or approval. It is thus noted that any conclusions made based on this project were not gained through research but through a quality improvement project carried out in a local context.

AUTHOR CONTRIBUTIONS

CAK led project and writing or main manuscript, editing, and submission. MDH oversaw and advised on project and manuscript, provided guidance, and editing. All other authors contributed equally to the idea generation, suggestions, and editing of the manuscript.

REFERENCES

1. Kulasegaram KM, Grierson LEM, Norman GR. The roles of deliberate practice and innate ability in developing expertise: evidence and implications. *Med Educ*. (2013) 47:979–89. doi: 10.1111/medu.12260
2. Pau A, Jeevaratnam K, Chen YS, Fall AA, Khoo C, Nadarajah VD. The Multiple Mini-Interview (MMI) for student selection in health professions training – a systematic review. *Med Teach*. (2013) 35:1027–41. doi: 10.3109/0142159X.2013.829912
3. Hanson MD, Kulasegaram KM, Woods NN, Fechtig L, Anderson G. Modified personal interviews: resurrecting reliable personal interviews for admissions? *Acad Med*. (2012) 87:1330–4. doi: 10.1097/ACM.0b013e318267630f
4. Hanson MD, Woods NN, Martimianakis MA, Rasasingham R, Kulasegaram K. Multiple independent sampling within medical school admission interviewing: an "intermediate approach". *Perspect Med Educ*. (2016) 5:292–9. doi: 10.1007/s40037-016-0298-9
5. Shappell E, Shakeri N, Fant A, Branzetti J, Gisondi M, Babcock C, Ahn J. Branding and recruitment: a primer for residency program leadership. *J Grad Med Educ*. (2018) 10:249–52. doi: 10.4300/JGME-D-17-00602.1
6. Waeraas A, Solbakk MN. Defining the essence of a university: lessons from higher education branding. *High Educ*. (2009) 57:449–62. doi: 10.1007/s10734-008-9155-z
7. Capers Q. How clinicians and educators can mitigate implicit bias in patient care and candidate selection in medical education. *ATS Scholar*. (2020) 211–7. 1. doi: 10.34197/ats-scholar.2020-0024PS
8. Bandiera G, Abrahams C, Ruetalo M, Hanson MD, Nickell L, Spadafora S. Identifying and promoting best practices in residency application and selection in a complex academic health network. *Acad Med*. (2015) 90:1594–601. doi: 10.1097/ACM.0000000000000954
9. Mylopoulos M, Brydges R, Woods NN, Manzone J, Schwartz DL. Preparation for future learning: a missing competency in health professions education? *Med Educ*. (2016) 50:115–23. doi: 10.1111/medu.12893
10. Lavrakus PJ. Paired comparison technique. In: *Encyclopedia of Survey Research Methods*. Thousand Oaks, CA: SAGE Publications (2008). p. 563–4.
11. Capers Q, McDougle L, Clinchot DM. Strategies for achieving diversity through medical school admissions. *J Health Care Poor Underserved*. (2018) 29:9–18. doi: 10.1353/hpu.2018.0002
12. Bass A, Wu C, Schaefer JP, Wright B, McLaughlin K. In-group bias in residency selection. *Med Teach*. (2013) 35:747–51. doi: 10.3109/0142159X.2013.801937

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

frontiers in Psychiatry

CONCEPTUAL ANALYSIS
published: 21 May 2021
doi: 10.3389/fpsyt.2021.658967

Simulation Training in Psychiatry for Medical Education: A Review

Marie-Aude Piot[1,2,3]*, *Chris Attoe*[4], *Gregoire Billon*[4], *Sean Cross*[4], *Jan-Joost Rethans*[5] *and Bruno Falissard*[3,6]

[1] School of Medicine, Faculty of Health, University of Paris, Paris, France, [2] Department of Psychiatry, Institute Mutualiste Montsouris, Paris, France, [3] Epidemiological and Public Health Research Centre, Villejuif, France, [4] Maudsley Simulation, South London and Maudsley National Health Service (NHS) Foundation Trust, London, United Kingdom, [5] Skillslab, Faculty of Health, Medicine and Life Sciences, Maastricht University, Maastricht, Netherlands, [6] Department of Public Health, School of Medicine, University Paris Saclay, Villejuif, France

Despite recognised benefits of Simulation-Based Education (SBE) in healthcare, specific adaptations required within psychiatry have slowed its adoption. This article aims to discuss conceptual and practical features of SBE in psychiatry that may support or limit its development, so as to encourage clinicians and educators to consider the implementation of SBE in their practice. SBE took off with the aviation industry and has been steadily adopted in clinical education, alongside role play and patient educators, across many medical specialities. Concurrently, healthcare has shifted towards patient-centred approaches and clinical education has recognised the importance of reflective learning and teaching centred on learners' experiences. SBE is particularly well-suited to promoting a holistic approach to care, reflective learning, emotional awareness in interactions and learning, cognitive reframing, and co-construction of knowledge. These features present an opportunity to enhance education throughout the healthcare workforce, and align particularly well to psychiatric education, where interpersonal and relational dimensions are at the core of clinical skills. Additionally, SBE provides a strategic opportunity for people with lived experience of mental disorders to be directly involved in clinical education. However, tenacious controversies have questioned the adequacy of SBE in the psychiatric field, possibly limiting its adoption. The ability of simulated patients (SPs) to portray complex and contradictory cognitive, psychological and emotional states has been questioned. The validity of SBE to develop a genuine empathetic understanding of patients, to facilitate a comprehensive multiaxial diagnostic formulation, or to develop flexible interpersonal skills has been criticised. Finally, SBE's relevance to developing complex psychotherapeutic skills is much debated, while issues such as symptom induction in SPs or patients involvement raise ethical dilemmas. These controversies can be addressed through adequate evidence, robust learning design, and high standards of practice. Well-designed simulated scenarios can promote a positive consideration of mental disorders and complex clinical skills. Shared guidelines and scenario libraries for simulation can be developed, with expert psychiatrists, patients and students involvement, to offer SPs and educators a solid foundation to develop training. Beyond scenario design, the nuances and complexities in mental healthcare are also duly acknowledged during the debriefing phases, providing a crucial opportunity to reflect on

OPEN ACCESS

Edited by:
Andres Martin,
Yale University, United States

Reviewed by:
Doron Amsalem,
Columbia University, United States
Mark Hanson,
University of Toronto, Canada

***Correspondence:**
Marie-Aude Piot
marie-aude.piot@imm.fr

Specialty section:
This article was submitted to Social Psychiatry and Psychiatric Rehabilitation, a section of the journal Frontiers in Psychiatry

Received: *26 January 2021*
Accepted: *20 April 2021*
Published: *21 May 2021*

Citation:
Piot M-A, Attoe C, Billon G, Cross S, Rethans J-J and Falissard B (2021) Simulation Training in Psychiatry for Medical Education: A Review. Front. Psychiatry 12:658967. doi: 10.3389/fpsyt.2021.658967

complex interpersonal skills or the role of emotions in clinicians' behaviour. Considered recruitment and support of SPs by clinical educators can help to maintain psychological safety and manage ethical issues. The holistic and reflexive nature of SBE aligns to the rich humanistic tradition nurtured within psychiatry and medicine, presenting the opportunity to expand the use of SBE to support a range of clinical skills and workforce competencies required in psychiatry.

Keywords: simulation training, mental health, learning, patient simulation, education medical

INTRODUCTION

Since the first experimentations with simulators in medicine in the sixties, simulation-based education (SBE) has become a well-established method to bridge the gap between theory and practice in medical education, moving from "best secret" to "best practice" (1). SBE is now recognised as an effective training tool to enhance medical error management, patient care and safety, and health professional team training (2). This training is defined as "a technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions" (3).

SBE appears to be a valuable and multidimensional method to improve healthcare delivery, deserving further development and adoption. In psychiatry, despite a strong history of utilising role play in the teaching of psychotherapy and in nursing education (4), its development has remained limited. This suggests that specific considerations and adaptations of SBE might be required to allow for its integration into routine mental health education.

This article aims to discuss conceptual and practical features of SBE in psychiatry that may support or limit its development, so as to encourage clinicians and educators to consider the implementation of SBE in their practice.

We based our argument on two main sources. To document SBE principles and the context of its development, we searched for the main historical texts which supported SBE development and the recognised guidelines to implement SBE based on updated evidence. Then, we focussed on the specific literature on SBE in psychiatry, building on a wide systematic review previously carried out, the protocol of which has been reported elsewhere (5). Furthermore, the content of this article reflects the practical experiences of psychiatrists and multi-professional teams working in clinical education and SBE for a number of years.

The article structures the argument through five distinct sections. We first provide the historical context which shaped the development of SBE in medicine and psychiatry. Subsequently, we outline some key theoretical frameworks underpinning SBE in mental health, and practical features of its implementation. Against this background, we discuss the opportunities and suitability of harnessing SBE more routinely within psychiatry to improve education, professional development, and clinical practice. We then present some of the controversies surrounding simulated practice in psychiatry, which may limit its development and require careful consideration. Finally, we discuss possible strategies and approaches to address these issues and capitalise upon the opportunities and broad potential offered by SBE in psychiatry.

HISTORICAL CONTEXT

Critical developments on SBE first happened in sectors liable to a high degree of risk, such as aviation, aeronautics and nuclear safety, to reduce human errors in high stake context. In healthcare, emergency medicine and intensive care were the first to thoroughly adopt this pedagogical tool. These fields are shaped by a culture of risk management, requiring a high degree of technical and procedural control based on rigorous teamwork. It became apparent that genuine attempts to minimise risks would need to tackle the "human factors" (6). What required improvement were "non-technical skills," including personal features (stress, tiredness), cognitive skills (situational awareness, decision making and planning) and social abilities (communication, teamwork and leadership). The field of human factors has had a considerable influence in the development of SBE, bringing back the ancient proverb "*Errare humanum est*" to the forefront of medical education and spurring a growing body of literature on cognitive bias (7).

While several countries conducted studies to assess the health and cost impact of medical errors (8), the American psychologist James Reason developed models to retrospectively analyse errors and enhance work practices. Reason offered a broad perspective, including both an analysis of the linear causal chain driving medical error, and a systemic analysis of the context in which the error happened. In the aviation industry, this led to the development of "Crew Resource Management" training, which has remained a robust framework for interprofessional training in healthcare (9), and contributed to the shift in focus from individual to collective care and learning.

Another strand leading to the development of SBE can be traced back to early experiments to emulate pathological states. In 1963, the neurologist Howard Barrow in Los Angeles conducted the first systematic experiments to portray neurological syndromes through acting, initially simulating multiple sclerosis (10). Here was born a new partner in clinical education: the simulated patient (SP). Despite early controversies about the cost and feasibility of using actors to play patients, SPs were rapidly adopted in medical education in the USA as powerful allies in training. They were made to portray an ever-growing range of physical

symptoms and challenges of the doctor-patient relationship, and took part in clinicians' assessments, with the progressive generalisation of Objective Structured Clinical Examinations (OSCEs; see **Table 1**).

Over the period, SPs were experimentally introduced in psychiatric institutions with a more radical aim in mind. In the famous experiment led by Rosenhan, undercover SPs portraying auditory hallucinations provided empirical support to the radical claims of the anti-psychiatry movement that psychiatric disorders were primarily a social construct perpetuated by its institutions (26). The undercover SPs remained hospitalised for 7 up to 52 days, despite dropping their symptoms following their admission as in-patients! This experiment highlighted the worryingly pervasive impact of some diagnostic labels, at times muddling clinical reasoning in psychiatry, while challenging the relevance of established boundaries between reason and insanity. While these challenges might have contributed to the more positivist approach to classify mental health disorders in psychiatry, from the third revision of the Diagnostic and Statistical Manual (DSM III, 1980) onwards, Rosenhan's experiment is a striking example of the power of simulation to trigger deep reflexivity on the complexity of psychiatric practices.

Several efforts were devoted to improving SP-based pedagogy, particularly through the creation of several associations, of which the Association of Standardized Patient Educators (ASPE) in 2001 is the most well-known. ASPE aims to foster advances in SP-based pedagogy, assessment, research, and scholarship (11). ASPE became a key player in human simulation, exemplifying the horizontal and democratic culture of SBE. By gathering both educators, real patients and SPs to define SP use guidelines, ASPE supports patients' influence in medical education, and ultimately medical care.

FRAMEWORK

Theories

The development of SBE is firmly grounded in several key developments of adult learning theories (27). Behaviourism helped to consider how pedagogical conditions support or limit technical acquisition (28). Cognitivism informed instructors on the perception and processing of information, recognizing further the essential role of emotions, motivation and metacognitions in learning (29). The notion of "self-efficacy" developed in Bandura's social cognitive learning theory was especially important for defining the belief in one's capacity to take action as a crucial driver of performance (30). The experiential learning theory developed by David Kolb and often summarised in the figure of a learning cycle also deeply influenced SBE (31, 32). Social constructionism has strongly influenced SBE, through the notion of subjective and collective construction of meaning, and the role of community and social context in learning (33–36). Other approaches, such as Cultural-Historical Activity Theory, further emphasised historical and cultural contexts that shape the group elaboration of meaning (37), while others still have helped to describe how SBE can challenge participants' assumptions and beliefs towards patients with mental disorders, for example transformative learning theory (38).

Finally, SBE has borrowed beyond the traditional boundaries of medical education. Psychodrama exposed mental health workers to the deep transformations instigated by simulations with the therapist and other patients, beyond one-to-one consultation (39). Significantly, SPs' performances share common features with acting and theatre practice. The notion of "state of I am," as developed by the theatre practitioner Constantin Stanislavsky, may be relevant for both of these contexts; that is "the point where I begin to feel myself in the thick of things, where I begin to coalesce with all the circumstances suggested by the playwright" (40). Theatre has also been brought to medical education to support students' empowerment in their learning and professional developments, as well as a means to question the social transformations of health systems and the very structure of medical care. It remains important for the field of SBE to continue to refine and develop its pedagogical approach, while making these underpinnings explicit to both educators and learners.

Practical Implementation

SBE starts with defining the issues to address, the learners' needs and specific learning objectives. Scenarios are carefully designed to portray either common psychopathological presentations, for basic training, or increasingly atypical or challenging situations for advanced learners (35).

SBE encompasses a diverse array of technologies developed to recreate clinical situations, from simple role play, to high-fidelity manikins and human simulated patients, to complex virtual reality (VR). **Table 1** summarizes SBE techniques, including a focus on those with a particular relevance to psychiatry.

Single episodes of SBE typically include three practical stages (**Figure 1**), with aims and remits varying according to participant groups and learning objectives. The first phase is the "pre-simulation briefing," or pre-briefing. This is an essential step to establish the safe learning environment required for SBE and prime learners for the intended learning activities (41). The second phase is the simulated scenario itself. It aims to recreate realistic clinical situations to embed participants in with sufficient fidelity and alignment to specified learning objectives. The third stage is the debriefing, where facilitated reflective conversations aim to convert the simulation experience and reflection into learning (42). Different debrief models can be used along a continuum from direct feedback and instructional teaching to more facilitative and reflective approaches (43, 44). There are consensual guidelines on some key features of debriefing in SBE's instructional design (45): the psychological safety of participants; their active involvement; Socratic questioning instead of direct feedback; led by a facilitator with specific training in debriefing; and who announces and enacts respect for the learners as a competent human being willing to improve, referred to as the basic assumption or principle. Other points remain debated, such as observers' roles in improving learning (46) or the place of video feedback (44).

TABLE 1 | Simulation technologies.

Technology	Definition	Applications, especially in psychiatry
Human simulation:	A "methodology that involves human role players interacting with learners in a wide range of experiential learning and assessment contexts" (11).	
• Role play	The patient role-player is "asked to be someone quite different from themselves and, with little or no preparation, perform in front of peers and teachers" (12).	Role-playing are usually reported as appropriate for mental disorders less difficult to portray by a novice (as typical depression, or some drug abuse disorders) (13).
• Simulated patient	"A person who has been carefully coached to simulate an actual patient so accurately that the simulation cannot be detected by a skilled clinician. In performing the simulation, the SP presents the gestalt of the patient being simulated; not just the history, but the body language, the physical findings, and the emotional and personality characteristics as well" (11).	Conversely for complex portrayals – such as schizophrenia or mania – for novice trainees can create the risk for providing caricatures or superficial simulations. SPs do enhance the validity of simulations however, including for all other disorders. Digital libraries of videos for medical education could improve this validity, as reported in recent articles (14–16). The most recent and exhaustive guidelines on SP training were built by the Association of Standardized Patient Educators (ASPE), upon the principles of safety, quality, professionalism, accountability and collaboration (11).
• Standardized patients	It means highly replicable scenario and SP training-, often used in high stakes educational decision to improve fidelity, enabling equity between the learners.	It is often used in high stakes educational decision – as OSCEs - to improve fidelity, enabling equity between the learners (17).
Manikin	"Full or partial body simulators that can have varying levels of physiologic function and fidelity" (3).	The use of manikins to recreate patients is more devoted to medical specialties where procedural simulation (and its high level of technic) is the priority, and the reproduction of non-technical features – as non-verbal signs of emotions- less important. However in psychiatry, some specific area may benefit from manikin, such as training discrete procedural skills as Electroconvulsivo-therapy (18, 19).
Virtual reality:	"The use of computer technology to create an interactive three-dimensional world in which the objects have a sense of spatial presence" (3) with which an individual can actively interact.	Its emerging went with important efforts to make encounters with virtual patients realistic enough to effectively engage learners. Studies suggest that VR have an impact on communication, teamwork and decision-making (20). Given the complexity in psychiatry, its use may improve self-confidence (21), work on assumption and believes toward patients and focus on clinical reasoning before meeting with a human SP. The opportunity to repeat the scenarios as many time as wished and for some of them, to easily broadcast in personal tables and smartphone, may recoup the cost of the high initial funding required to design appropriate VR, while extending infinitely the dissemination.
• e.g.,: Voice simulation	The "use of sounds and voice through an electronic medium to portray the sounds encountered by a schizophrenic patient" (22).	Designed by patients themselves - inside the movement of patient experiential recovery, as Patricia Deegan - this technology enables the health trainee to experiment in part auditory hallucinations from a first-person view. Trainees are often missioned to complete cognitive tasks during the listening, to increase the proximity with real schizophrenic experiences and their struggles for completing life challenges. Through improving the identification with patients, this simulation experience increases the empathy toward people with schizophrenia (23), while reducing previous assumptions and believes that often stigmatize person with mental disorders (24).
Objective structured clinical exams (OSCEs)	OSCE is composed by series of short stations that the trainee has to complete, each of them focusing on one clinical or other professional task; examination is performed through direct observation, checklist, scale, learner presentation or written follow-up exercise (3).	An exhaustive guide has been developed by the Psychiatric Skills Assessment Project (PSAP) of University of Toronto (17) and updated since and updated since (25), describing of several steps to implement different psychiatric scenarios in an OSCE.

FIGURE 1 | The basic three stages process of SBE.

OPPORTUNITIES AND SUITABILITY OF SBE IN PSYCHIATRY

Person-centred Care

The "person-centred medicine" (PCM) movement developed the explicit promotion of the subjectivity of the person with an illness and including the sociocultural environment in care delivery (47). The World Psychiatric Association supported the development of this approach in psychiatry affirming "*the whole person of the patient in context* as the centre and goal of clinical care and health promotion," within a multidimensional approach (including the biological, psychological, sociocultural, spiritual, ethical and artistic dimensions, as well as the users' views) (48).

Calling for skilled practitioners who can integrate an interactional and personalised model of care, PCM challenges traditional educational approaches (49). Authoritarian and directive teaching, overlooking the learner's experience, matches reductionist and paternalistic models of care overlooking the patient's experience (49). Consequently, PCM requires an educational approach that promotes an interactive and dialectical learning environment. Such educational environments encourage participants to include their personal background and motivations in the learning process, and make the development of a reflective understanding a cornerstone to becoming a competent and self-aware practitioner. SBE offers several practical features which align with PCM's agenda, some of which are particularly relevant to psychiatry where complex subjective and interpersonal processes are at the heart of the delivery of care.

By the virtue of its experiential nature, SBE involves the "whole person" of both the learner and the patient. Contrary to traditional teaching, such as large group lectures set up for knowledge acquisition, SBE allows to work at the same time on the physical, affective, and cognitive features involved in the simulated scenario. SBE provides a unique opportunity to rehearse and enact the complex interpersonal processes pertaining to psychiatric care. During the simulated encounter, the person played by the SP presents themselves "as a whole," instead of being first considered as a collection of symptoms, as a psychiatric handbook may suggest. These initial perceptions, the "first impressions" with the patient, were previously emphasised by psychiatric phenomenology as a global perception essential to understand the patient through pattern recognition (50, 51). In addition, several scenarios can be played successively to portray the patient journey through clinical pathways over a period of time. SBE can support a diachronic understanding of the patient, which provides a more comprehensive perspective on the patient than the snapshot view of a diagnosis or a single presentation.

Psychiatric SBE can be construed as a learner-centred approach, further promoting a person-centred approach in clinical care. The flexibility of SP and trainers allow adaptation of the experience, tailored feedback and reflection to the needs and characteristics of the learners. By including physical, affective and cognitive features in the learning process, participants are also considered as a "whole person." This is particularly relevant when training some essential psychiatric skills, for instance the empathetic skills that learners should demonstrate towards each other and their patients. Indeed, this can even extend to learning experiences that allow clinicians to reflect on their own health or work-related needs.

Finally, SBE offers an increasingly recognised role to real and expert patients with mental disorders to get involved in clinical education and have a say in the way they want to be cared for. Indeed, SBE can include patients at each step of the SBE developments, including scenario design, SP training, simulated scenarios, and feedback in debriefing.

The Nature of Psychiatric Care

SBE is particularly suitable to psychiatric care as evidenced by its facilitation of a person-centred approach, the acquisition of reflective skills, a common focus on attitudinal change and multi-disciplinary work, and cognitive reframing and co-construction of care. Recently, learner-centred approaches have highlighted current issues encountered by clinicians – such as racial tensions or transphobia – to co-construct simulations in real time together with clinicians, trained simulated patients and educators (35, 36). These factors align to the cognitive and interpersonal skills required for psychiatric care and allow education to remain up to date with clinical practices and issues encountered.

Prevailing changes within healthcare further highlight the opportunity afforded by SBE, such as reduced availability of

patient contact and bedside teaching in clinical placements due to evolutions in psychiatric care delivery, for example ward closures, community psychiatric service restructure, specialist teams, fewer senior clinicians, and more severe and complex patients (52). It is then surprising that SBE has remained relatively underdeveloped in the psychiatric field compared to other specialities, and that psychiatry has not led the development of SBE in areas with such complex learning outcomes to push the boundaries of simulated patient scenarios (4).

Reflective Practice and Attitudinal Change

The opportunity to acquire or deepen reflexive skills may be especially relevant in psychiatry, where health workers typically need these skills to develop a treatment plan, rather than primarily applying structured guidelines. Likewise, the opportunity to reflect collectively on the diversity of perceptions for the same clinical situation mirrors the way that psychiatric teams collectively build these representations of the patients. The opportunity to challenge assumptions and beliefs of learners should be welcomed in psychiatry, prioritising self-awareness and reflection. Assumptions, beliefs, and attitudes require challenging throughout psychiatric practice and consequently throughout psychiatric education at all levels for all professionals.

Indeed, when patients' presenting complaints are "psychiatric behaviour disorders," a label of "manipulative," or "borderline personality," or with a "history of drug abuse," patients are often met with negative assumptions by practitioners (53). Many health students have negative attitudes towards this discipline as individuals with mental disorders are often feared, stigmatised, and stereotyped (54–56). They are often seen as difficult to understand, even hermetic, with students reporting they often don't know what to say or worrying that they might cause harm by acting in the wrong way, due to the complexity of relational skills and attitudes required (57). Even newly qualified doctors lack confidence in assessing and managing common psychiatric problems more than other conditions (52). For adolescent SPs portraying psychiatric conditions, a study found increased anticipated role discomfort because of stigma related with mental disorders (58).

Considering dual-process theory on clinical reasoning, these negative feelings are bound to influence the intuitive response of health workers and impact on the reliability of their clinical reasoning (53). Conversely, attitudes relating to self-confidence, anxiety, assumptions and beliefs are common outcomes reported in psychiatric SBE research (13), emphasising the great effort ensured by SBE to make psychiatry more accessible to medical students and health workers more globally. This may support fighting against stigmatisation described more than 40 years ago (59) and still present even among health care workers.

Multi-disciplinary Team Working

SBE supports the long tradition of multidisciplinary teams working in psychiatry required to provide high quality care for mental disorders. The ability of SBE to bring together different professions and specialties to learn together and in multi-disciplinary teams reflects how care is and should be delivered (4). When clinical teams engage in SBE together, this creates opportunities to gain insights into their work as a team in a dedicated educational space free from clinical demands, supporting creativity and translation of learning into practice. When health workers engage in interprofessional SBE with unfamiliar colleagues, their individual development and learning from others is complementary across the group. Further, SBE can expose health workers to unusual or uncommon scenarios that they may have had limited opportunity to engage with individually or within teams. This is particularly true for more inexperienced staff, and for emergency or out-of-hours situations, such as managing a mental health crisis (60).

Emerging Evidence on Psychiatric SBE

Outcomes of RCTs, non-RCTs, and pre/post-test studies provide some evidence on the effectiveness of SBE in psychiatry, collated in a recent systematic review including 163 studies (13). Two third of studies included attitude outcomes, one-third included skills and knowledge, while behaviours and patients' benefits were included in 10% of identified studies. In the 27 RCTs included in meta-analysis, significant differences were found at immediate post-tests for simulation groups compared with both active and inactive control groups on attitudes, skills, knowledge and behaviours of medical doctors and participants. Significant differences were also found at 3-month follow-ups with large effect sizes for behaviour-based outcomes and small effect sizes for skills-based and patient benefits outcomes. Moreover, two third of pre/post-test studies found significant differences on attitudes, skills, knowledge and behaviours of participants, alongside around half of the controlled studies. However, the low number of controlled studies undermine the strength of the evidence. Similarly, regarding patients' benefits, the smaller number of studies and the heterogeneity amongst the time-points of assessment make interpretation difficult. The authors concluded that the number of RCTs was sufficient for pooling meta-analyses, but not enough to provide overwhelming evidence, despite some very high quality research (61). They encourage further research including RCTs, focused on participants' behaviours and patient outcomes, longitudinal evaluations, and even long-term assessment of cost-effectiveness.

The review highlighted high heterogeneity across studies, including pedagogical conditions (e.g., scenarios, debriefing modalities, length, educational aims, adjuvant pedagogies in more than three questers of studies), participant levels (mixing medical levels and/or health professions), and the outcomes and instruments to measure them. While this heterogeneity may limit the quality of the evidence, it is consistent with the diverse and complex nature of psychiatry and the multifaceted nature of SBE, increasing the external validity of these results.

CONTROVERSIES IN PSYCHIATRIC SBE

Intensity and Requirements of SBE

SBE requires deep, intense involvement and engagement for both participants and trainers. For participants, performing in front of peers can be demanding. Unpredictable simulated scenarios can reveal intimate parts of oneself and one's behaviour, such as spontaneous emotions or reactions that are usually privately

shared with the patient or with familiar colleagues. Thus, the high cognitive, emotional, and physical load for participants while peers and trainers are observing, can generate stress, performance anxiety, or fears of being judged. This stress could inhibit participants' interest in SBE and their ability to derive learning from all aspects of the training experience. Additionally, feedback or collective discussion on features with which the participant is not familiar may be perceived as intrusive or uncomfortable without an appropriately safe and collaborative learning environment. Further, debriefing that aims to uncover and maybe reframe emotions and cognitions can cause discomfort due to exposure within the group. However, it must be noted that the power and potential of SBE connects closely with the opportunity to create a learning environment that facilitates the friendly challenge and constructive discomfort that allows the generation of deep and complex learning. The key to ensuring this opportunity lies with facilitators to prepare and manage interactions with and within the group accordingly, although SBE literature has struggled to provide clear and thorough guidance (42, 45).

For trainers too the implementation of SBE may be very challenging, requiring time and effort to achieve high quality. The design of well-suited scenarios and guidance for simulated patients require careful consideration, piloting, and continual adjustments to tailor to the learners' needs. The recruitment, training, support, and monitoring of SPs are time-consuming and require continuous work and consideration of the SP as an important member of the training team. Trainers themselves must be trained and supported both formally and informally, reviewing and encouraging their development and reflection. Further, the efforts for trainers on the day begin and end well before and after the training has been completed. Indeed, the time requirements can often lead trainers to opt for shorter SBE formats using directive feedback and simpler scenarios. The intensive small group format may also be prohibitive for systems, settings, and countries where the ratio of trainers to participants is low or other resources are lacking beyond time and human capacity. Even technologically advanced SBE, such as virtual reality, requires considerable time and resource demands in creating and testing realistic virtual scenarios.

Consequently, the requirements of SBE for participants, trainers, and systems are considerable. This may explain why role play has been used for a long time in psychiatry. However, beyond time and cost often mentioned as a barrier to SBE, its implementation in psychiatry has further specific challenges.

Specific Challenges of SBE in Psychiatry

Some authors still question the ability of SPs to embody a complex set of often contradictory cognitive, psychological and emotional features to support valid learning (12). This raises necessary distinction between an authentic – the "impossibility to distinguish SPs from patients" (62)– and a valid portrayal. Authenticity supports the learner involvement in the learning, since students can report difficulties engaging with the scenario when they perceive the simulation as unrealistic (62). However, the "impossibility to distinguish" refers to the rater's subjective perception, possibly restrained by a limited experience for most students. Thus, a slightly too caricatured portrayal missing some ambivalent and conflicting features may appear authentic to a student, but not to an experienced psychiatrist.

Another risk, if SPs were unable to elicit a learner's empathy, would be to paradoxically lead to a shallow interaction that prevents participants from detecting nuances and subtlety in the diagnosis. This may affect the validity of training, while inducing superficial or even inadequate representations. As a result, there is a specific need for realism and an emotionally engaging depiction of patients with mental disorders in psychiatric SBE, to enable learners to develop a real understanding of the patient experience, a comprehensive multiaxial differential diagnosis, and a flexible relationship. However, conversely, teaching psychotherapeutic and complex interpersonal skills raises other issues regarding emotions. Indeed, there may be a difference between an empathic response (of the learner) to an actual dramatic character (the SP) compared with the response they would have to a future real patient whom the learner will support (63). While SPs are trained to arouse emotion, patients with mental disorders do not plan how they will present to the physician. The part of themselves to be uncovered may be uncertain, even resistant, as much for themselves as for the clinician. The role of the physician is precisely to establish an authentic empathic rapport to help the patient to soften conflicted feelings, by "feeling ahead" of the patient and intuiting what can't be linked (63). These essential psychotherapeutic skills may remain elusive to the SBE set up.

Concurrently, the notion of prototypes of clinical portrays, often used to offer appropriate training to novices, may be invalid in psychiatry due to the singular experience of each patient with a mental disorder. This issue is also raised by recent developments in virtual reality (64, 65), interviewing a patient with mental disorders in Second Life (66), or an adolescent with PTSD (67), which question even more the believability of virtual characters, and their ability to elicit a realistic experiences for novice clinicians. Here there is a risk that participants learn a reality about patient with mental disorders that is inaccurate, based on portrayals of these experiences rather than real experiences themselves, such as interacting with real patients. This has been described as "hyper-reality" (68), where an excessive use of symbols substitutes the real experience, first highlighted by mass media in the seventies. Yet, beyond false psychopathological features, the difference between learner/fictional character relationship and the real doctor-patient relationship would enable students to act out good relationships without being authentically involved (12).

In addition, the choice of mental disorders pictured is often driven by epidemiological considerations, especially for early career training. This creates the risk of reinforcing stigmatisation and stereotypes towards patients. For example, characterizing an eating disorders patient as a white middle class female. There is a constant balance between a realistic portrayal of individual, social, and epidemiological experience of mental disorder and unhelpful stereotyping. This requires the involvement of real patients in education and reflexivity from the trainers and SPs.

Moreover, while promising results are reported for SPs in psychiatric OSCE assessment, there is a trade-off between

the standardisation process required and the validity of the psychiatric portrayal (69). Indeed, exams require a strong reliability, both test-retest and inter-rater reliability, in scenarios in order to offer equal opportunities in assessment for learners. At the same time, the complexity of psychiatric care sometimes needs a lot of flexibility to be valid in simulated scenarios, according a learner's reaction. It may mean that SPs should often both reflect the patient they are portraying, and their own personal response to the psychopathology being presented, to remain plausible (12). More globally, this raises the underlying paradox inherent to psychiatric presentations: there is a direct conflict between a rigidly scripted portrayal and a valid and realistic portrayal, which requires flexible adaptation to an unfolding interaction.

Furthermore, there are areas of psychopathology where the fictional nature of the simulation set up might create some confusion and somehow limit simulation's educational benefits. Pretend mode, false beliefs and the blurring of boundaries between fiction and reality are all common features of simulation practice as well as a number of psychiatric disorders, e.g., "as-if personalities," malingering, narcissistic disorders. The practitioner has to uncover the part of the person, which may be either simulated (consciously or not), factitious, mythomaniac, delusional, etc. In these cases, with the fictional nature of the simulation set-up may confuse the matter further and limits effective training (63), while learners need a secure well-defined frame to develop reflective practice.

Finally, because of the complexity of mental disorder experience, the ability of SPs to provide feedback on the phenomenological experience of psychosis, for example, may be more complex and unfamiliar than for a SP who portrays diabetes. A lack of nuance creates the risk to perpetuate stigma, albeit unwillingly, through inappropriate feedback and portrayal of illness.

Given the above issues of validity and complexity, SP training in psychiatry requires careful consideration, from rigorous recruitment criteria, to comprehensive and diversified training on the mental health issues at stake, followed by quality assurance of their performance. Some articles report demanding ways to reach appropriate training: combining video of patients testimonies or doctor-patient interviews, with some immersions into in-patient and ambulatory services, and meeting real patients, in addition to basic SBE training (including learning scenario, readings, in-depth explanations with the trainer, and several behavioural rehearsals (17, 69).

Moreover, ethical issues are raised by the nature of the roles SPs are required to enact. Phenomena such as role adherence, blurring between the role and the person's real life and physical exhaustion are reported (70). The results vary according to different features of the person who depicts the patient: temperament, gender, age, own history and background (and especially psychiatric history, as discussed above). For example, stronger identification effects were reported for adolescents who depicted a psychiatric case, because of contagion effects (71, 72), such as when depicting depression symptoms or suicidal ideations (73, 74). This warrants a careful monitoring of SPs (careful recruitment; proper de-rolling; and close SP monitoring to prevent long-term psychological effects), which may need consideration when allocating resources to SBE.

To address the difficulties of working with trained SPs in psychiatry, the opportunity to recruit real patients appears complex too (75): for example, development of a detached style resistant to any acting and rehearsal training; choice to describe opinions about treatments instead of depicting pre-treatment symptoms. Most of all, playing personal stories for a patient with mental disorders (or a story of their own mental illness) to improve realism creates a risk of potential psychological consequences through to mental health crisis, while for some diseases (such as psychosis), boundaries between thoughts (including delusion) and reality remain blurred. Moreover, possible painful questions raised carelessly during the debriefing may hurt the real patient, even with training. Similarly, the opportunity for a real patient to give appropriate feedback may be further debated given individuals' experience of mental disorders, and the difficulties for patients with mental disorders to adopt enough distance or a metacognitive position to report a more general experience on their pathology. However, if ethical dilemmas and practical issues are given due consideration, involving patients with lived experience in the design and delivery of simulation training can be a very rewarding experience for all involved (76).

DISCUSSION

SBE appears to be particularly well-suited to psychiatry, supporting a holistic person-centred approach, reflective skills acquisition, emotional elaborations, cognitive reframing and co-construction of care. It also provides an opportunity to involve people with a personal experience of mental disorders in clinical education. However, the validity of the SP portrayal, the complexity of psychotherapeutic skills and the specificities of SPs require due consideration to be effectively implemented.

First, considering the issue of realism of psychiatric portrayal, we should endorse a heuristic notion of "good enough" portrayal rather than "perfect depiction." Indeed, given the wide variety of singular mental disorders experiences, an excessive essentialisation of symptoms in a unique prototype bares the risk of a robotic portrayal. However, some adjustments may be necessary to reach appropriate learning. Indeed, this notion of "prototype" of psychiatric portrayal may be assumed as a step to make this specialty more accessible to medical students. Moreover, the SP portrayal can be explored during the debriefing with facilitators and observers sharing perspectives from their clinical experience, and by complementary learning activities after SBE (such as real patients video testimonies, workplace supervision of clinical clerkships, among others). For example, even a very short social contact-based video of no more than 90 s can reduce efficiently stigmatisation toward patients with a schizophrenia (77). Furthermore, realism may be fostered by *ad hoc* resources to train SPs. Videos demonstrating good quality portrayals and simulations of people with mental disorders by SPs, based on expert consensus, could provide a digital library to support SP training. This should

take into account culturally appropriate portrayals of mental disorder. To reach this consensus and improve the quality and inclusiveness of this library, the group of experts should be multidisciplinary, composed by recognised researchers and experienced practitioners, as well as expert real patients, and medical students. Recent work supports the relevance of skilled video clips of psychiatric SPs depicting psychopathology to teach mental status exam (14), sex education in child and adolescent psychiatry (15), electroconvulsive therapy (16). Furthermore, to prevent a rigid and limited portrayal for each mental disorder, this library may include several variations of a given disorder to cover different clinical presentations. Ultimately, the best way for educators to promote the pedagogy of SBE as a powerful tool against stigmatisation is to be aware, reflexive and constantly collaborating with patients.

Secondly, it appears necessary to acknowledge SBE limitations to train in certain interpersonal skills. For example, the subtle phenomena emerging inside a long-term and familiar psychotherapeutic relationship might not be adequately grasped by SBE training. However, SBE may enable specific training on some specific components of psychotherapeutic skills, counselling skills (78) including some more complex processes such as therapeutic alliance ruptures.

Working on complex interpersonal skills requires deliberate adjustments in the training structure. Indeed, most SBE training assumes that simulated scenarios help to identify participants' performance gap and explore them through facilitated debriefing to close these gaps by highlighting some of the erroneous cognitions leading to these errors. The underlying model of debriefing can be roughly summarised as aiming to enhance clinical performance; in other words a "plus/delta" model of learning. This remains close to the "metaphor of acquisition," or "the act of gaining knowledge," which leads most of the literature on learning until the middle of the twentieth century (79). This approach was subsumed over the past decades by the "metaphor of participation," suggesting that knowledge building is more a result of participation within a group, including being inducted to its language and social rules, through a continuous and collaborative experience rather than transfer or possession of knowledge (79). Yet, in complex interpersonal relationship, such as those within psychiatric care, or also child abuse, end-of-life, there is rarely a single suitable way to behave, in contrast to situations where strong evidence-based guidelines are the rules. Thus, in such complex situations, workers often perceive the same clinical situation differently and agree on a "sensible margin" within which the care must be delivered. Thereby within a constructivist approach, SBE enables for all the participants to observe the same situation, and to share their different perspectives on this same situation during the debriefing, which enables them to learn from each other. The structure of debriefing should thus include the principles of both participation and acquisition, supporting verbalisation of each participant's view, then fostering reflexivity as a group to collaboratively define appropriate behaviours within appropriate care. Due to its familiarity with such complex interpersonal relationships, psychiatric SBE could in turn contribute to all SBE that deals with complex human interactions in medical education.

Similarly, the management of emotions requires dedicated consideration in psychiatry, beyond the attention usually given to emotional responses as part of human factors. Following simulated scenarios, participants are often encouraged to verbalise the elicited emotions. However, this verbalisation often aims to defuse the emotions or recognise its negative impact on performance, to enable the participants to master technical skills. In psychiatric SBE, the identification and elaboration of emotions also aims to regulate emotion so as to improve the participant's self-confidence in care management. However, emotions are also considered as vehicles for meaning and integral to relational experiences that should be entirely integrated in diagnosis and therapeutic practices. As such they remain an important focus of debriefing conversations beyond the initial reaction phase, supporting the deepening of reflection and self-awareness.

Finally, psychiatric SBE remains an essential opportunity to put patients at the centre of medical education. This embodies the health democracy developments of the past decades while supporting a central credo of the Recovery movement: "nothing about us without us" (80). Patients can advise on the co-constructions of appropriate scenarios, using their subjective to supplement professional views, while guiding the acting of SPs through their holistic experiential lens. Their first-person experience can also broaden the reflexivity during debriefing while providing real-life anecdotes which exemplify the importance of words, attention and authenticity of relationships. Their testimony in addition to the affective load mobilised by simulation can support efficiently students' empathy developments accordingly. However, patient involvement must be arranged, structured, and managed carefully and supportively. The fear of retraumatising, symptoms induction, or even inability to fully consent (as in an active psychotic episode) limit the opportunities for them to be SPs and for SBE participation more globally. However, there is limited evidence and guidance on this practice in the literature, meriting further exploration for an area that can have significant benefits.

Recent developments within virtual reality or particular uses of manikins and voice simulations might be a way to circumvent risks of symptoms induction and re-traumatisation. However, for human simulation, clinical educators must be involved in SP recruitment and monitoring to mitigate risks, from the beginning to the end of the training and beyond. This might require clinicians to have a dual role as an educator and manager of the SP pool (including de-rolling after simulations) to retain some clinical insight to assess SPs suitability to remain involved, to contain symptoms emergence, and to ensure adequate follow-up.

The involvement of real patients in SBE presents a wonderful opportunity to hear real patients' voice, and should not be pre-empted by a paternalistic approach that would like to protect patients at their own expense. However, each opportunity to involve patients should not be taken for granted. Any patient involvement needs to be managed with due diligence to individuals' needs, considering both the patient's willingness and the clinician's assessment. Simulated patients are required to enact a complex performance, balancing fidelity with individual

learner's reactions and keeping in mind the session learning objectives. These tasks are demanding even for professional actors, and even more so for patients who may not benefit from the professional distance with their own emotional reactions to the subject matter. Patients should retain some freedom to withdraw their involvement every time they can have a role in SBE. The opportunity to engage patients in clinical education should be considered in many creative ways, to contribute to diverse learning experiences, but their utilisation in simulated scenarios requires a very cautious an tentative approach.

CONCLUSION

SBE is often seen as a high-tech device, through its heritage rooted in aeronautic or aviation, reflected in its development in technical fields of health care such as anaesthesiology, obstetrics, or surgical specialties. This may scare psychiatric educators away from this training method. However, SBE relates to core dimensions of clinical interactions as multifaceted experiences where communication processes have critical effects, which is particularly true in psychiatry. This can support participants to explore how relationships and communication can have serious consequences for people's health and experience of care. Consequently, SBE is not a mere innovation or by-product of the technological age, but a refined pedagogical approach deeply rooted in a holistic approach as promoted by the World Psychiatric Association (47) in continuity with the medical tradition of a therapeutic *praxis*, as described by Greek philosophers, such as Socrates, and doctors, such as Hippocrates, both emphasising the patient as a whole person and the relationship as an essential conduit of care.

SBE elicits an intense and personal engagement of the learners in a setup borrowing from the performing arts. It offers opportunities for collective reflexivity and co-construction of knowledge that can be compared with community and groups processes as described by anthropologists, systemic approaches, or in mental health institutions. SBE constitutes a rich and flexible cultural artefact lending itself to further creative appropriation, following a diversity of learning needs through many contexts and cultures, present and future.

Finally, clinical educators within psychiatry can greatly benefit from and contribute to the field of SBE, with their clinical experience focusing on intrapersonal, interpersonal, and relational dimensions of care, alongside expert communication skills, that can be transferred from clinical work to the educational setting. We posit that the field of SBE as a whole can benefit from its further implementation and development within mental health education, arguing for clinicians and patients to engage with this powerful pedagogical tool.

AUTHOR CONTRIBUTIONS

All authors contributed to the conceptual analysis. M-AP wrote the first draft of the manuscript. The remaining authors commented and modified successive drafts. All authors contributed and have approved the final manuscript.

REFERENCES

1. Levine AI, DeMaria Jr S, Schwartz AD, Sim AJ. *The Comprehensive Textbook of Healthcare Simulation*. New York, NY: Springer Science & Business Media (2013). p. 721. doi: 10.1007/978-1-4614-5993-4
2. Cook DA, Hatala R, Brydges R, Zendejas B, Szostek JH, Wang AT, et al. Technology-enhanced simulation for health professions education: a systematic review and meta-analysis. *JAMA*. (2011) 306:978–88. doi: 10.1001/jama.2011.1234
3. Lopreiato JO, Downing D, Gammon W, Lioce L, Sittner B, Slot V, et al. *Healthcare Simulation Dictionary*. (2016). Available online at: http://www.ssih.org/dictionary (accessed January 25, 2021).
4. Attoe C, Kowalski C, Fernando A, Cross S. Integrating mental health simulation into routine health-care education. *Lancet Psychiatry*. (2016) 3:702. doi: 10.1016/S2215-0366(16)30100-6
5. Piot MA, Dechartres A, Guerrier G, Lemogne C, Layat-Burn C, Falissard B, et al. Effectiveness of simulation in psychiatry for initial and continuing training of healthcare professionals: protocol for a systematic review. *BMJ Open*. (2018) 8:e021012. doi: 10.1136/bmjopen-2017-021012
6. Renouard F, Charrier J-G. *Looking for the Weak Link: Initiation to the Human Factor*. Chatillon: Ewenn (2011). p. 221.
7. Reason J. *Human Error*. New York, NY: Cambridge university press (1990). p. 320. doi: 10.1017/CBO9781139062367
8. Donaldson MS, Corrigan JM, Kohn LT. *To Err Is Human: Building a Safer Health System*. Washington DC: National Academies Press (2000).
9. Kowalski C, Attoe C, Ekdawi I, Parry C, Phillips S, Cross S. Interprofessional simulation training to promote working with families and networks in mental health services. *Acad Psychiatry*. (2018) 42:605–12. doi: 10.1007/s40596-017-0840-z
10. Barrows HS, Abrahamson S. The programmed patient: a technique for appraising student performance in clinical neurology. *Acad Med*. (1964) 39:802–5.
11. Lewis KL, Bohnert CA, Gammon WL, Holzer H, Lyman L, Smith C, et al. The association of standardized patient educators (ASPE) standards of best practice (SOBP). *Adv Sim*. (2017) 2:10. doi: 10.1186/s41077-017-0043-4
12. McNaughton N, Ravitz P, Wadell A, Hodges B. Psychiatric education and simulation: a review of the literature. *Can J Psychiatry*. (2008) 53:85–93. doi: 10.1177/070674370805300203
13. Piot MA, Dechartres A, Attoe C, Jollant F, Lemogne C, Layat Burn C, et al. Simulation in psychiatry for medical doctors: a systematic review and meta-analysis. *Med Educ*. (2020) 54:696–704. doi: 10.1111/medu.14166
14. Martin A, Jacobs A, Krause R, Amsalem D. The mental status exam: an online teaching exercise using video-Based depictions by simulated patients. *MedEdPORTAL J Teach Learn Resour*. (2020) 16:10947. doi: 10.15766/mep_2374-8265.10947
15. Drozdowicz L, Gordon E, Shapiro D, Jacobson S, Zalpuri I, Stewart C, et al. Sexual health in child and adolescent psychiatry: multi-site implementation through synchronized videoconferencing of an educational resource using standardized patients. *Front Psychiatry*. (2020) 11:593101. doi: 10.3389/fpsyt.2020.593101
16. Kitay B, Martin A, Chilton J, Amsalem D, Duvivier R, Goldenberg M. Electroconvulsive therapy: a video-Based educational resource using standardized patients. *Acad Psychiatry J Am Assoc Dir Psychiatr Resid Train Assoc Acad Psychiatry*. (2020) 44:531–7. doi: 10.1007/s40596-020-01292-z
17. Hodges B, Hanson M, McNaughton N, Regehr G. Creating, monitoring, and improving a psychiatry oSCE. *Acad Psychiatry*. (2002) 26:134–61. doi: 10.1176/appi.ap.26.3.134

18. Raysin A, Gillett B, Carmody J, Goel N, McAfee S, Jacob T. From information to simulation: improving competency in eCT training using high-Fidelity simulation. *Acad Psychiatry*. (2018) 42:653–8. doi: 10.1007/s40596-017-0859-1
19. Rabheru K, Wiens A, Ramprasad B, Bourgon L, Antochi R, Hamstra SJ. Comparison of traditional didactic seminar to high-fidelity simulation for teaching electroconvulsive therapy technique to psychiatry trainees. *J ECT*. (2013) 29:291–6. doi: 10.1097/YCT.0b013e318290f9fb
20. Peddle M, Bearman M, Nestel D. Virtual patients and nontechnical skills in undergraduate health professional education: an integrative review. *Clin Sim Nurs*. (2016) 12:400–10. doi: 10.1016/j.ecns.2016.04.004
21. Pantziaras I, Fors U, Ekblad S. Innovative training with virtual patients in transcultural psychiatry: the impact on resident psychiatrists' confidence. *PLoS ONE*. (2015) 10:e0119754. doi: 10.1371/journal.pone.0119754
22. Williams B, Reddy P, Marshall S, Beovich B, McKarney L. Simulation and mental health outcomes: a scoping review. *Adv Simul*. (2017) 2:2. doi: 10.1186/s41077-016-0035-9
23. Bunn W, Terpstra J. Cultivating empathy for the mentally ill using simulated auditory hallucinations. *Acad Psychiatry*. (2009) 33:457–60. doi: 10.1176/appi.ap.33.6.457
24. Galletly C, Burton C. Improving medical student attitudes towards people with schizophrenia. *Aust N Z J Psychiatry*. (2011) 45:473–6. doi: 10.3109/00048674.2011.541419
25. Hodges BD, Hollenberg E, McNaughton N, Hanson MD, Regehr G. The psychiatry OSCE: a 20-year retrospective. *Acad Psychiatry*. (2014) 38:26–34. doi: 10.1007/s40596-013-0012-8
26. Rosenhan DL. On being sane in insane places. *Science*. (1973) 179:250–8. doi: 10.1126/science.179.4070.250
27. Taylor DC, Hamdy H. Adult learning theories: implications for learning and teaching in medical education: aMEE guide no. 83. *Med Teach*. (2013) 35:e1561–72. doi: 10.3109/0142159X.2013.828153
28. Bernard J-L, Reyes P. Learning in medicine (first part). *Pedag Med*. (2001) 2:163–9. doi: 10.1051/pmed:2001031
29. Jouquan J, Romanus C, Vierset V, Jaffrelot G, Parent F. Supporting active education as support to reflective practice and to deep learning. In: Parent F, Jouquan J, editors. *Thinking Training for Healthcare Worker. An Integrative Perspective*. Bruxelles: De Boeck (2013). p. 245–284.
30. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev*. (1977) 84:191. doi: 10.1037/0033-295X.84.2.191
31. Husebø SE, O'Regan S, Nestel D. Reflective practice and its role in simulation. *Clin Sim Nurs*. (2015) 11:368–75. doi: 10.1016/j.ecns.2015.04.005
32. Kolb D. *Experiential Learning*. Englewood cliffs: Prentice Hall (1984). p. 256.
33. Vygotsky LS, Cole M, John-Steiner V, Scribner S, Souberman E. The development of higher psychological processes. *Mind Soc*. (1978) 1–91.
34. Wenger E. *Communities of Practice: Learning, Meaning, and Identity*. New York, NY: Cambridge University Press (1999). doi: 10.1017/CBO9780511803932
35. Martin A, Weller I, Amsalem D, Duvivier R, Jaarsma D, de Carvalho Filho MA. Co-constructive patient simulation: a learner-centered method to enhance communication and reflection skills. *Simul Health J Soc Simul Health*. (2020) 2. doi: 10.1097/SIH.0000000000000528
36. Martin A, Weller I, Amsalem D, Adigun A, Jaarsma D, Duvivier R, et al. From learning psychiatry to becoming psychiatrists: a qualitative study of co-constructive patient simulation. *Front Psychiatry*. (2020) 11:616239. doi: 10.3389/fpsyt.2020.616239
37. Eppich W, Cheng A. How cultural-historical activity theory can inform interprofessional team debriefings. *Clin Sim Nurs*. (2015) 11:383–9. doi: 10.1016/j.ecns.2015.05.012
38. Parker B, Myrick F. Transformative learning as a context for human patient simulation. *J Nurs Educ*. (2010) 49:326–32. doi: 10.3928/01484834-20100224-02
39. Moreno JL. The role concept, a bridge between psychiatry and sociology. *Am J Psychiatry*. (1961) 118:518–23. doi: 10.1176/ajp.118.6.518
40. Smith CM, Gephardt EG, Nestel D. Applying the theory of stanislavski to simulation: stepping into role. *Clin Sim Nurs*. (2015) 11:361–7. doi: 10.1016/j.ecns.2015.04.001
41. Rudolph JW, Raemer DB, Simon R. Establishing a safe container for learning in simulation: the role of the presimulation briefing. *Sim Health*. (2014) 9:339–49. doi: 10.1097/SIH.0000000000000047
42. Fanning RM, Gaba DM. The role of debriefing in simulation-based learning. *Sim Health*. (2007) 2:115–25. doi: 10.1097/SIH.0b013e3180315539
43. Sawyer T, Eppich W, Brett-Fleegler M, Grant V, Cheng A. More than one way to debrief: a critical review of healthcare simulation debriefing methods. *Sim Health*. (2016) 11:209–17. doi: 10.1097/SIH.0000000000000148
44. Cheng A, Eppich W, Grant V, Sherbino J, Zendejas B, Cook DA. Debriefing for technology-enhanced simulation: a systematic review and meta-analysis. *Med Educ*. (2014) 48:657–66. doi: 10.1111/medu.12432
45. Kolbe M, Grande B, Spahn DR. Briefing and debriefing during simulation-based training and beyond: content, structure, attitude and setting. *Best Pract Res Clin Anaest*. (2015) 29:87–96. doi: 10.1016/j.bpa.2015.01.002
46. O'Regan S, Molloy E, Watterson L, Nestel D. Observer roles that optimise learning in healthcare simulation education: a systematic review. *Adv Sim*. (2016) 1:4. doi: 10.1186/s41077-015-0004-8
47. Mezzich JE, Botbol M, Christodoulou GN, Cloninger CR, Salloum IM. Introduction to person-centered psychiatry. In: Mezzich JE. *Person Centered Psychiatry*. Swizerland: Soringer (2016). p. 1–15. doi: 10.1007/978-3-319-39724-5_1
48. Mezzich JE. Psychiatry for the person: articulating medicine's science and humanism. *World Psychiatry*. (2007) 6:65.
49. Ramalho R, Montenegro R, Djordjevic V, Bras M, Christodoulou N. Person-centered psychiatric education. In: Mezzich JE. *Person Centered Psychiatry*. Swizerland: Soringer. (2016). P. 539–549. doi: 10.1007/978-3-319-39724-5_39
50. Quintin J, Thiboutot C. *Great Figures of Existential Psychopathology*. Montreal: Liber (2020).
51. Martin B, Piot M-A. Phenomenological approah of schizophrenia. *L'Information Psychiatr*. (2011) 87:781–90. doi: 10.3917/inpsy.8710.0781
52. Abed R, Teodorczuk A. Danger ahead: challenges in undergraduate psychiatry teaching and implications for community psychiatry. *Br J Psychiatry*. (2015) 206:89–90. doi: 10.1192/bjp.bp.114.146852
53. Pelaccia T, Tardif J, Triby E, Charlin B. An analysis of clinical reasoning through a recent and comprehensive approach: the dual-process theory. *Med Educ Online*. (2011) 16:5890–9. doi: 10.3402/meo.v16i0.5890
54. Robinson-Smith G, Bradley PK, Meakim C. Evaluating the use of standardized patients in undergraduate psychiatric nursing experiences. *Clin Sim Nurs*. (2009) 5:e203–e11. doi: 10.1016/j.ecns.2009.07.001
55. Stuart GW. *Principles and Practice of Psychiatric Nursing-e-Book*. Mosby: Elsevier Health Sciences (2014). p. 832.
56. Lehr ST, Kaplan B. A mental health simulation experience for baccalaureate student nurses. *Clin Sim Nurs*. (2013) 9:e425–31. doi: 10.1016/j.ecns.2012.12.003
57. Ogard-Repal A, De Presno AK, Fossum M. Simulation with standardized patients to prepare undergraduate nursing students for mental health clinical practice: an integrative literature review. *Nurs Educ Today*. (2018) 66:149–57. doi: 10.1016/j.nedt.2018.04.018
58. Hanson MD, Johnson S, Niec A, Pietrantonio AM, High B, MacMillan H, et al. Does mental illness stigma contribute to adolescent standardized patients' discomfort with simulations of mental illness and adverse psychosocial experiences? *Acad Psychiatry*. (2008) 32:98–103. doi: 10.1176/appi.ap.32.2.98
59. Goffman E. Stigma and social identity. In: Raiwater L. *Deviance & Liberty: Social Problems and Public Policy*. New York, NY: Routledge (1974). p. 446.
60. Ortega Vega M, Williams L, Saunders A, Iannelli H, Cross S, Attoe C. Simulation training programme to improve the integrated response of teams in mental health crisis care. *BMJ STEL*. (2020) 7:bmjstel-2020-000641. doi: 10.1136/bmjstel-2020-000641
61. Sanci L, Chondros P, Sawyer S, Pirkis J, Ozer E, Hegarty K, et al. Responding to young people's health risks in primary care: a cluster randomised trial of training clinicians in screening and motivational interviewing. *PLoS ONE*. (2015) 10:e0137581. doi: 10.1371/journal.pone.0137581
62. Wuendrich MS, Nissen C, Feige B, Philipsen AS, Voderholzer U. Portrayal of psychiatric disorders: are simulated patients authentic? *Acad Psych*. (2012) 36:501–2. doi: 10.1176/appi.ap.11090163
63. Brenner AM. Uses and limitations of simulated patients in psychiatric education. *Acad Psychiatry*. (2009) 33:112–9. doi: 10.1176/appi.ap.33.2.112

64. Albright G, Bryan C, Adam C, McMillan J, Shockley K. Using virtual patient simulations to prepare primary health care professionals to conduct substance use and mental health screening and brief intervention. *J Am Psych Nurs Assoc.* (2018) 24:247–59. doi: 10.1177/1078390317719321
65. Ekblad S, Mollica RF, Fors U, Pantziaras I, Lavelle J. Educational potential of a virtual patient system for caring for traumatized patients in primary care. *BMC Med Educ.* (2013) 13:110. doi: 10.1186/1472-6920-13-110
66. Shultz E, Pandya M, Mehta N. Technology and teaching: suicide risk assessment. *Med Educ.* (2013) 47:1132–3. doi: 10.1111/medu.12322
67. Kenny P, Parsons TD, Gratch J, Rizzo AA. Evaluation of justina: a virtual patient with pTSD. International workshop on intelligent virtual agents. In: Prendinger H, Lester J, Ishizuka M, editors. *Intelligent Virtual Agents. IVA 2008 Lecture Notes in Computer Science; 5208*. Berlin, Heidelberg: Springer (2008).
68. Baudrillard J, Foss P. *The precession of simulacra*. New York, NY: Semiotext (1983). p. 5.
69. Shirazi M, Sadeghi M, Emami A, Kashani AS, Parikh S, Alaeddini F, et al. Training and validation of standardized patients for unannounced assessment of physicians' management of depression. *Acad Psychiatry.* (2011) 35:382–7. doi: 10.1176/appi.ap.35.6.382
70. Woodward CA, Gliva-McConvey G. The effect of simulating on standardized patients. *Acad Med.* (1995) 70:418–20. doi: 10.1097/00001888-199505000-00020
71. Woodward CA, Gliva-McConvey G. Children as standardized patients: initial assessment of effects. *Teach Learn Med.* (1995) 7:188–91. doi: 10.1080/10401339509539739
72. Spencer J, Dales J. Meeting the needs of simulated patients and caring for the person behind them? *Med Educ.* (2006) 40:3–5. doi: 10.1111/j.1365-2929.2005.02375.x
73. Hanson M, Tiberius R, Hodges B, Mackay S, McNaughton N, Dickens S, et al. Implications of suicide contagion for the selection of adolescent standardized patients. *Acad Med.* (2002) 77:S100–102. doi: 10.1097/00001888-200210001-00031
74. Hanson MD, Niec A, Pietrantonio AM, Johnson S, Young M, High B, et al. Effects associated with adolescent standardized patient simulation of depression and suicidal ideation. *Acad Med.* (2007) 82:S61–4. doi: 10.1097/ACM.0b013e31813ffedd
75. Krahn LE, Bostwick JM, Sutor B, Olsen MW. The challenge of empathy: a pilot study of the use of standardized patients to teach introductory psychopathology to medical students. *Acad Psychiatry.* (2002) 26:26–30. doi: 10.1176/appi.ap.26.1.26
76. Attoe C, Billon G, Riches S, Marshall-Tate K, Wheildon J, Cross S. Actors with intellectual disabilities in mental health simulation training. *J Men Health Train Educ Pract.* (2017) 12:272–8. doi: 10.1108/JMHTEP-04-2017-0024
77. Amsalem D, Yang LH, Jankowski S, Lieff SA, Markowitz JC, Dixon LB. Reducing stigma toward individuals with schizophrenia using a brief video: a Randomized controlled trial of young adults. *Schizophr Bull.* (2021) 47:7–14. doi: 10.1093/schbul/sbaa114
78. Fernandez-Liria A, Rodriguez-Vega B, Ortiz-Sanchez D, Baldor Tubet I, Gonzalez-Juarez C. Effectiveness of a structured training program in psychotherapeutic skills used in clinical interviews for psychiatry and clinical psychology residents. *Psychother Res.* (2010) 20:113–21. doi: 10.1080/10503300903131907
79. Sfard A. On two metaphors for learning and the dangers of choosing just one. *Educ Res.* (1998) 27:4–13. doi: 10.3102/0013189X027002004
80. Leamy M, Bird V, Le Boutillier C, Williams J, Slade M. Conceptual framework for personal recovery in mental health: systematic review and narrative synthesis. *Br J Psychiatry.* (2011) 199:445–52. doi: 10.1192/bjp.bp.110.083733

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

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 23 June 2021
doi: 10.3389/fpsyt.2021.671442

INteractive Virtual Expert-Led Skills Training: A Multi-Modal Curriculum for Medical Trainees

Michelle Curtin[1], Jennifer Downs[1,2], Amber Hunt[2], Emily R. Coleman[3], Brett A. Enneking[1] and Rebecca McNally Keehn[1]*

[1] Division of Child Development, Department of Pediatrics, Riley Child Development Center, Indiana University School of Medicine, Indianapolis, IN, United States, [2] Division of Child and Adolescent Psychiatry, Department of Psychiatry, Indiana University School of Medicine, Indianapolis, IN, United States, [3] Indiana University School of Medicine, Indianapolis, IN, United States

Background: Internationally, pediatric depression and suicide are significant issues. Additionally, in the context of the COVID-19 pandemic, pediatric mental health needs are rising astronomically. In light of Child & Adolescent Psychiatrist (CAP) subspecialist shortages in the United States (US), there is an increasing call for primary care physicians in Family Medicine and Pediatrics to address an increasingly broad variety of patient needs. Here we report on the development and preliminary evaluation of medical student and resident perceptions on the "INteractive Virtual Expert-led Skills Training" (INVEST) medical education curriculum, a virtual synchronous CAP curriculum employing active learning strategies, including expert-led discussion and video modeling, and discussion designed to meet those priorities.

Methods: In a standardized 60-min training format, our curriculum leverages audience response system polling, video modeling of key clinical skills, and interactive discussion with an expert subspecialist, over a virtual video conferencing platform. The primary educational strategy relies on use of video modeling to demonstrate best practice with CAP led group discussion to solidify and explain important concepts. Five waves of medical students and residents (N = 149) participated in the INVEST curriculum and completed pre- and post-training surveys regarding knowledge and comfort in the management of pediatric patients with depression and suicidality.

Results: Trainee participants reported significant positive gains in perceived likelihood of encountering pediatric suicidality as well as knowledge/comfort with depression screening and suicidality assessment in a primary care setting. Across some competency areas, there was an effect of medical learner level. Learners at lower levels generally reported the highest benefit. Medical students reported significant increases in their comfort interpreting and discussing positive depression screens and evidenced the greatest relative benefit in comfort with discussing suicidality.

Conclusion: To our knowledge, INVEST is the first fully virtual, multimodal curriculum led by expert CAP subspecialists. Our findings suggest that INVEST shows promise for equipping medical learners with baseline knowledge for caring for patients with pediatric

OPEN ACCESS

Edited by:
Andres Martin, Yale University, United States

Reviewed by:
Robbert Duvivier, Parnassia Psychiatric Institute, Netherlands
Shashank Joshi, Stanford University, United States

***Correspondence:**
Michelle Curtin
mjcurtin@iu.edu

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

Received: *23 February 2021*
Accepted: *28 May 2021*
Published: *23 June 2021*

Citation:
Curtin M, Downs J, Hunt A, Coleman ER, Enneking BA and McNally Keehn R (2021) INteractive Virtual Expert-Led Skills Training: A Multi-Modal Curriculum for Medical Trainees. Front. Psychiatry 12:671442. doi: 10.3389/fpsyt.2021.671442

depression and suicidality. This synchronous, virtually delivered curriculum allows for critical training delivered to diverse medical learners regardless of geographic location, a particular benefit during the current COVID-19 pandemic.

Keywords: medical education, adolescent, primary care, depression, suicidality, underserved

INTRODUCTION

Internationally, pediatric depression and suicide are significant issues. Depression impacts ∼6.2% of children and adolescents ages 5–17 years (1), resulting in impact to school performance and relationships. Compared to adults, diagnosis and treatment for children and adolescents are much more challenging (2) and subsequently only half of adolescents with depression are diagnosed before adulthood (3). While for individuals 15–29 years of age it is well documented that suicide is the second leading cause of death (4), information on suicide in pre-adolescents is less readily known; one study estimated the mean rate of suicide in children and young adolescents up to 14 years is ∼0.6/100.00 worldwide (5). Additionally, in the context of the COVID-19 pandemic, pediatric mental health needs are rising astronomically (6). With the staggering impact of depression and suicidality on children and teens, identification and treatment are critical. The need now, more than ever, for virtual trainings (7) which target these skill areas, allowing access to real-world situations in low risk environments (8, 9) across diverse geographic locations (10) has become urgent.

However, severe workforce shortages exist in the Child & Adolescent Psychiatry (CAP) workforce (11, 12), which impact patient access to quality care (13–16) particularly in rural areas (11, 15). In light of CAP subspecialist shortages in the United States (US), there is an increasing call for primary care physicians in Family Medicine and Pediatrics to address an increasingly broad variety of patient needs, including mental health conditions such as depression and suicidality (14, 17, 18). However, primary care providers (18, 19) and residents in primary care residency training programs (17, 20, 21) report inadequate knowledge and skill in the assessment, diagnosis and treatment of these areas. To care for these patient needs, medical providers must acquire basic competence in pediatric mental and behavioral health (14, 22), including development of both interpersonal communication skills (23) and content knowledge (24–26).

Targeted curricula that employ novel training modalities (27–30) that make use of the available tools (31–33) are needed to make optimal use of the limited CAP workforce available as teaching experts (12, 13, 15, 16, 34). The "Guidelines for Adolescent Depression in Primary Care" for instance address steps to practice transformation to initiate identification and initial management of adolescents with depression in the primary care setting (31). In the United States, the American Academy of Child & Adolescent Psychiatry has proposed "Best Principles for Integration of Child Psychiatry into the Pediatric Health Home" focused on principles to apply the medical home model to psychiatric care needs for this population (35). Other tools, such as "Project TEACH's free library" of mental health screen "Resources"[1], the American Academy of Pediatrics "Mental Health Toolkit" [2], and the PHQ-9 depression screen, are additionally being shared virtually to support practice expansion to care for the mental health needs of children and adolescents. While all of these guidelines and tools offer practices the ability to self-guide with evidence-based information around pediatric depression and suicidality, there is still a role for interactive training to build competency for providers.

To address the need for new ways of supporting primary care skill development to address the soaring pediatric depression and suicidality rates (1, 4, 5) in light of the international CAP workforce limitations (11, 12, 36), our team sought to develop a virtually-delivered medical education curriculum on the care of these patients. This virtual training was meant to suit a traditional 60-min didactic teaching block for medical students and residents in the primary care field of Family Medicine. The team's goal was to improve the awareness and comfort in responding to positive screening results of pediatric depression and suicidality in the outpatient setting of participants. Here we report on the development and preliminary evaluation of medical student and resident perceptions on the "INteractive Virtual Expert-led Skills Training" (INVEST) medical education curriculum (here after referred to as our curriculum), a virtual synchronous CAP curriculum employing active learning strategies (20, 37, 38) of expert-led video modeling, and discussion designed to meet those priorities (39).

METHODS

This study was determined to be "Protocol Exempt" following review by Indiana University IRB (approved 2/17/2020; reference number 2001953926A001). All methods were performed in accordance with the relevant guidelines and regulations. Information on the voluntary nature of the research study for informed consent was provided on all pre- and post-surveys.

Development of INVEST Curriculum

Developed by a multidisciplinary team of subspecialists at Indiana University School of Medicine (IUSM), our curriculum was designed as a fully virtual multimodal training curriculum (8, 17, 19, 22, 24, 30, 40, 41) delivered by CAP faculty members. Multimodal trainings (20, 22, 42) use a variety of curriculum delivery methods in a single training (e.g. video modeling, readings, didactic sessions, expert feedback, etc.) and have demonstrated longer lasting impact on skill development compared to traditional, lecture based education (42–45) with improved patient outcomes (44, 46), enhanced clinician skills in discussion of sensitive topics (9, 47–49), enhanced engagement with vulnerable patients (20, 50, 51), and greater facilitation of

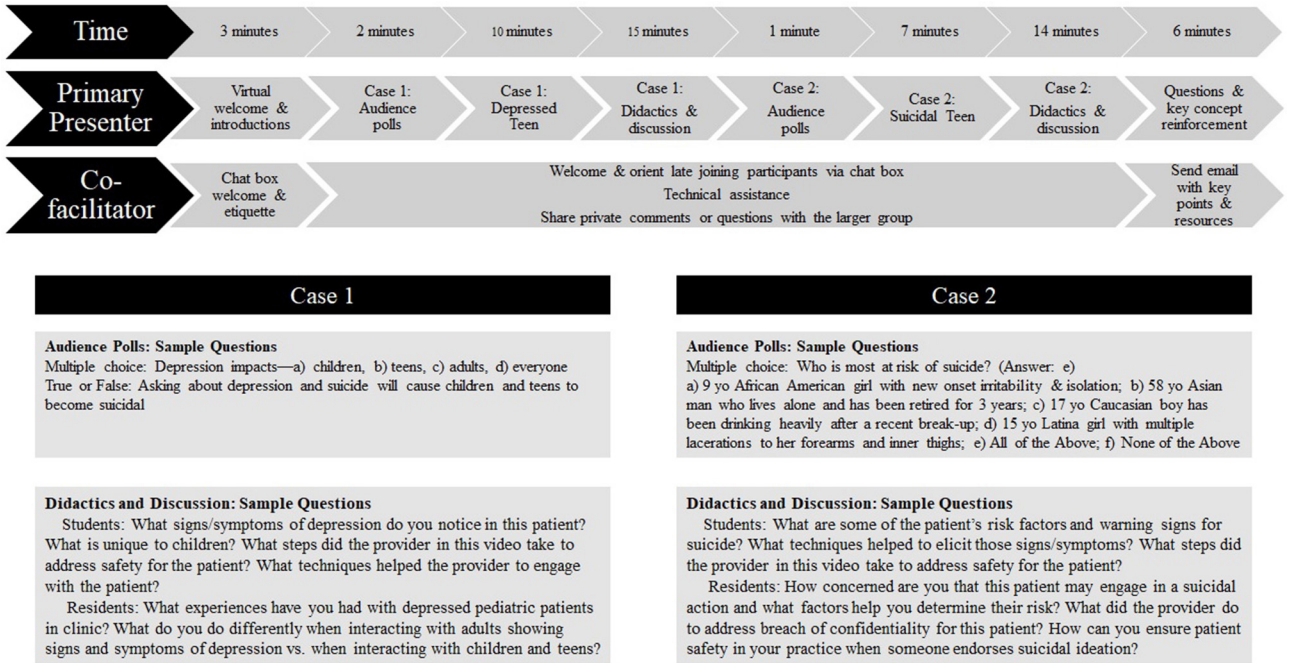

FIGURE 1 | INVEST Curriculum. Content above delivered by faculty boarded in Child & Adolescent Psychiatry. Supplemental work was performed by the co-facilitator, including chat box technical assistance, trainee engagement, and collecting trainee questions and concerns.

linkages with community support resources (9). Our curriculum format was grounded in adult learning theory to address the varied experiences in the clinic and classroom of medical students and residents, building new information over their existing scaffold, and supporting lifelong learning tendencies (19, 52, 53). Ongoing financial and labor investment (38) were minimized through the development of a single structure that could be given by multiple personnel in the field without significant curriculum specific training. The curriculum structure is designed to promote active learning in primary care students and residents through particular focus on the (1) impact of mental and behavioral health condition(s), (2) available screening tool(s), and (3) patient interviewing and feedback skills for use in a primary care outpatient clinical setting. Our curriculum provides educational content (20, 50) on (1) pediatric depression, including prevalence, symptoms, and key differences between pediatric and adult presentation, and (2) suicidal behavior, including features of suicidal ideation, differences between ideation and attempt, risk factors, and strategies for discussing suicidality with patients (**Supplementary Material**).

In a standardized 60-min training format, our curriculum leverages audience response system polling, video modeling of key clinical skills, and interactive discussion with an expert subspecialist, over a virtual video conferencing platform (see **Figure 1**). The primary educational strategy relies on use of video modeling to demonstrate best practice with CAP led group discussion to solidify and explain important concepts. Our team produced two recorded video models of outpatient pediatric primary care appointments with a patient actor that demonstrated behavioral health assessment competencies as well as coordination and communication between the physician, patient, and office support staff. The first 10-min video models a clinician interviewing an adolescent patient with a positive Patient Health Questionnaire-9 (PHQ-9)[3], which is widely-used in primary care for depression screening, augmented by discussion on the PHQ-9 results and interpretation, key history taking for depression diagnosis, and discussion of symptoms unique to pediatric patients. The second 7-min video models a clinician addressing a positive PHQ-9 with endorsement of suicidality symptoms, including performing a safety assessment and consideration of how to discuss need for disclosure to the adolescent's caregivers. These video modeling examples lay the groundwork for interactive discussion between learners and the CAP subspecialist, used in conjunction with virtual polling to address common misperceptions around pediatric depression and suicidality, and a limited number of content slides to ensure all attendees received an overview of pediatric depression and suicidality.

Our curriculum was initially delivered to 30 medical students and residents; pre- and post-training surveys were collected (see survey description below) and qualitatively used to improve the curriculum. Adaptations made following this trial included: (1) addition of a co-facilitator to provide real-time technical assistance, promote discussion via virtual platform chat box, and facilitate and manage discussion flow, (2) creation of discussion prompts (tailored for student or resident learners), (3) use of a mid-point discussion break in the first 10 min video to promote additional discussion, and (4) implementation of a post-training

follow-up email with key curriculum points and resources (see **Figure 1** for a flow chart of INVEST).

The final curriculum included a primary presenter and a co-facilitator who provided education as a team. While the topics of pediatric depression and suicide were consistently taught via videos, polling questions, content slides, and discussion questions (set at level for either residents or medical students), each time the training was given some variability occurred during discussion based on questions and/or comments from the participants. Secondary to a total 60-min available for the training, each of these components was time limited. The primary presenter focused on delivery of content including running the polling software, facilitating group discussion around the video models, and delivering content (e.g., key points). The co-facilitator provided technological support throughout the presentation by helping participants who logged on after the presentation had started, collecting chat box questions (public and private) which the primary presenter could not see in presentation mode, supporting group engagement via chat box prompts, and anticipating or responding to technical issues. A follow up email with a content summary and clinical resources was sent to all attendees following the close of the presentation.

Assessment of INVEST Curriculum

Following Cook and colleagues' (39) framework for medical education research, a modified justification study design was used to assess learner perceptions about curriculum impact. Although justification designs often compare one educational intervention to another, a first step in assessing intervention efficacy is often to examine pre-post changes across a number of different learning domains (e.g., learner knowledge/attitude, clinical diagnosis, clinical interventions, teaching and leadership, assessment). In the present study, we focus on evaluating learner changes in knowledge and attitudes following engagement in the training. In order to measure this outcome, a self-report survey was developed to assess change across key learning objectives of the our curriculum. The survey consisted of seven items scored on a five-point Likert scale (see **Table 2** for survey items). Likert scale anchors for survey items are as follows: Items 1/2: 1 (Very unlikely/rarely) - 5 (Very likely/at least weekly); Items 3/6: 1 (Nothing) - 5 (A great deal/I could explain it to others); Items 4/5/7: 1 (Very uncomfortable/I'd try to avoid doing it) - 5 (Very comfortable/would not hesitate).

Participants

Our curriculum was delivered to medical students and Family Medicine (FM) residents across two institutions in five waves from 5/1/2020 to 6/30/2020. In all trainings, the presenters were generally unknown to participants. Curriculum participants were recruited through (1) medical student special interest group events (Pediatrics, Neurology, Psychiatry) which were open to any student, and (2) FM program directors seeking opportunities for resident didactic education in pediatrics and mental and behavioral health. In total, 170 participants completed our curriculum; 149 participants completed pre- and post-surveys (response rate = 88%). See **Table 1** for participant characteristics.

TABLE 1 | Participant characteristics: graduate degree, medical training level, and medical specialty area of the participants ($N = 149$).

Participants	*n* (%)
Graduate degree	
MD	70 (47.0)
DO	79 (53.0)
Medical trainee level	
MS I	10 (6.7)
MS II	20 (13.4)
MS III	29 (19.5)
MS IV	49 (32.9)
PGY I	19 (12.8)
PGY II	10 (6.7)
PGY III	11 (7.4)
PGY V	1 (0.7)
MS intended specialty[a]	
Pediatrics	37 (34.3)
Family medicine	30 (27.8)
Other	19 (17.6)
Undecided	8 (7.4)
Psychiatry	7 (6.5)
Pediatrics-based combo residency	4 (3.7)
Neurology/child neurology	3 (2.8)
Resident specialty[a]	
Family medicine	38 (95.0)
Neurology/child neurology	1 (2.5)
Other	1 (2.5)

[a] *Primary care: pediatrics, family medicine, internal medicine, internal medicine-pediatrics; Specialty care: psychiatry, neurology, OB/GYN, emergency medicine, dermatology, surgery, orthopedics, sleep medicine.*

Data Collection and Analysis

Pre- and post-training surveys were collected electronically via REDcap (54, 55). Non-parametric statistical analyses were completed using SPSS Statistics 27.0 (56). We explored differences from pre- to post-training for all participants using Wilcoxan Signed Rank tests. To examine the effect of medical trainee level, participants were grouped based on clinical skill development: MS I-II ($n = 30$); MS III ($n = 29$); MS IV ($n = 49$); PGY I ($n = 19$); PGY II-III ($n = 21$). To explore effects of medical student intended specialty, two groups were created: (1) primary care ($n = 36$), and (2) specialty care ($n = 15$); see **Table 1** for description of specialty grouping [Insert **Table 1**]. Using Kruskal-Wallis tests, we examined the effects of medical trainee level and intended medical specialty on change in scores from pre- to post-training by creating difference scores for each survey item. When a significant main effect was present, we conducted *post hoc* analyses using Mann-Whitney tests and Wilcoxan Signed Rank tests.

RESULTS

See **Table 2** for item-level descriptive statistics for both pre- and post-scores for all participants, and participants by medical

TABLE 2 | Item-level survey descriptive statistics for all participants ($N = 149$) by level and medical specialty area.

Survey Item	Median (Range)															
	All Sample		MS I-II		MS III		MS IV		PGY I		PGY II-III		MS-IPC		MS-ISC	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
(1) How likely do you think you are to encounter child/adolescent patients with depression?	4 (4)	4 (4)	4 (4)	5 (4)	4 (4)	5 (3)	4 (4)	4 (4)	4 (3)	3 (3)	4 (3)	4 (2)	4 (4)	5 (3)	4 (4)	4 (4)
(2) How likely do you think you are to encounter child/adolescent patients with suicidal thoughts/feelings/behaviors?	3 (4)	4 (4)	3 (4)	4 (4)	3 (4)	4 (4)	3 (4)	4 (4)	3 (3)	3 (3)	3 (4)	3 (3)	4 (4)	4 (3)	3 (3)	3 (4)
(3) How much do you know about depression in children/ adolescents?	3 (4)	4 (4)	2 (2)	3 (4)	3 (4)	4 (2)	3 (2)	4 (2)	3 (2)	3 (3)	3 (2)	4 (2)	3 (4)	4 (3)	2 (2)	3 (3)
(4) How comfortable do you feel interpreting a depression screener?	3 (4)	4 (4)	3 (3)	3 (4)	3 (2)	4 (3)	3 (3)	4 (2)	4 (3)	4 (3)	4 (2)	4 (2)	3 (3)	4 (4)	3 (3)	4 (3)
(5) How comfortable do you feel discussing a positive screen?	3 (4)	4 (3)	2 (3)	4 (3)	3 (4)	4 (3)	3 (3)	4 (2)	4 (4)	4 (2)	4 (2)	4 (2)	3 (4)	4 (2)	3 (3)	3 (3)
(6) How much do you know about performing a suicidality assessment?	3 (4)	3 (4)	2 (4)	3 (4)	3 (3)	3 (3)	3 (3)	4 (3)	2 (3)	3 (2)	3 (2)	4 (2)	2 (3)	3 (4)	2 (4)	3 (4)
(7) How comfortable do you feel discussing thoughts/feelings around suicidal thoughts/feelings/behaviors in children/adolescents?	3 (4)	4 (3)	2 (3)	3 (3)	3 (3)	4 (3)	3 (3)	4 (3)	3 (3)	4 (2)	4 (3)	4 (3)	3 (4)	4 (3)	3 (3)	4 (3)

MS-IPC, medical student-intended primary care; MS-ISC, medical student-intended specialty care.

trainee level (student or resident year) and medical specialty. See **Table 3** for item-level descriptive statistics for difference scores by training level and medical specialty.

Item 1: How Likely Do You Think You Are to Encounter Child/Adolescent Patients With Depression?

There was no significant difference pre- to post- training in the perceived likelihood of encountering children/adolescents with depression ($Z = 815.00$, $p = 0.07$). There was a significant effect of medical trainee level on difference scores [$H(4) = 17.74$, $p = 0.001$]. Pairwise comparisons revealed that MS I-II showed significantly greater difference scores than all other training levels (all $p < 0.046$); no other pairwise comparisons across training levels were significant (all $p > 0.16$). A significant difference was found from pre- to post-training for MS I-II ($Z = 114.00$; $p = 0.001$) such that MS I-II participants rated perceived frequency higher following the training. This finding was not significant for any other training level (all $p > 0.11$).

Item 2: How Likely Do You Think You Are to Encounter Child/Adolescent Patients With Suicidal Thoughts/Feelings/Behaviors?

There was a significant difference pre- to post- training in participants' perceived likelihood of encountering children/adolescents with suicidal thoughts/feelings/behaviors ($Z = 1652.00$, $p = < 0.001$) indicating that participants rated perceived frequency higher following delivery of our curriculum. There was no significant effect of training level [$H(4) = 2.07$, $p = 0.72$] on difference scores.

Item 3: How Much Do You Know About Depression in Children/Adolescents?

There was a significant difference pre- to post- training in perceived knowledge about depression in children/adolescents ($Z = 1{,}652.00$, $p = < 0.001$) with participants rating perceived knowledge higher following the training. There was no significant effect of medical trainee level [$H(4) = 2.16$, $p = 0.71$] on difference scores.

Item 4: How comfortable Do You Feel Interpreting a Depression Screener?

There was a significant difference pre- to post- training in participants' comfort interpreting a depression screener ($Z = 4{,}379.50$, $p = < 0.001$) with comfort increasing following participation in our curriculum. There was a significant effect of medical trainee level on difference scores [$H(4) = 12.61$, $p = 0.01$]. Pairwise comparisons revealed significant variation in difference scores between MS I-III and PGY I-III as well as between MS IV and PGY II-III (all $p < 0.04$) with lower medical

TABLE 3 | Item-level descriptive statistics for difference scores by participant level and intended medical specialty area ($N = 149$).

Survey Item	Median (Range)						
	MS I-II	MS III	MS IV	PGY I	PGY II-III	MS-IPC	MS-ISC
(1) How likely do you think you are to encounter child/adolescent patients with depression?	0.00 (4)	0.00 (4)	0.00 (4)	0.00 (3)	0.00 (3)	0.50 (4)	0.00 (4)
(2) How likely do you think you are to encounter child/adolescent patients with suicidal thoughts/feelings/behaviors?	0.00 (3)	0.00 (4)	0.00 (3)	0.00 (2)	0.00 (4)	0.50 (4)	0.00 (4)
(3) How much do you know about depression in children/adolescents?	1.00 (3)	1.00 (3)	1.00 (3)	1.00 (2)	1.00 (2)	1.00 (2)	1.00 (3)
(4) How comfortable do you feel interpreting a depression screener?	1.00 (5)	1.00 (2)	1.00 (4)	0.00 (3)	0.00 (3)	1.50 (2)	1.00 (5)
(5) How comfortable do you feel discussing a positive screen?	1.00 (4)	1.00 (4)	0.00 (3)	0.00 (3)	0.00 (2)	0.50 (2)	1.00 (5)
(6) How much do you know about performing a suicidality assessment?	1.00 (4)	1.00 (2)	1.00 (3)	1.00 (4)	1.00 (3)	1.00 (2)	1.00 (4)
(7) How comfortable do you feel discussing thoughts/feelings around suicidal thoughts/feelings/behaviors in children/adolescents?	1.00 (4)	1.00 (3)	1.00 (3)	1.00 (3)	0.00 (3)	1.00 (2)	1.00 (3)

MS-IPC, medical student-intended primary care; MS-ISC, medical student-intended specialty care.

trainee levels showing greater gains in comfort than higher training levels. No other pairwise comparisons were significant (all $p > 0.10$). A significant difference was found from pre- to post- training for MS I-II ($Z = 238.00$; $p = 0.002$), MS III ($Z = 231.00$; $p < 0.001$), and MS IV ($Z = 572.00$; $p < 0.001$), such that participants across these medical trainee levels rated their comfort higher following participation in our curriculum. This finding was not significant for PGYI-III (all $p > 0.08$).

Item 5: How Comfortable Do You Feel Discussing a Positive Screen?

There was a significant difference pre- to post- training in participants' comfort discussing a positive depression screener with patients ($Z = 2{,}854.00$, $p = < 0.001$) with comfort increasing following the training. Additionally, there was a significant effect of medical trainee level on difference scores [$H\ (4) = 16.00$, $p = 0.003$). Pairwise comparisons revealed significant variation in difference scores between MS I-IV and PGY II-III as well as between MS I-II and PGY I (all $p < 0.03$) with lower medical trainee levels showing greater gains in comfort than higher medical trainee levels. No other pairwise comparisons were significant (all $p > 0.10$). A significant difference was found from pre- to post- training for MS I-II ($Z = 204.00$; $p < 0.001$), MS III ($Z = 121.00$; $p = 0.003$), and MS IV ($Z = 314.50$; $p < 0.001$), with these participants rating their comfort higher following participation in our curriculum. This finding was not significant for PGY I-III (all $p > 0.25$).

Item 6: How Much Do You Know About Performing a Suicidality Assessment?

There was a significant difference pre- to post- training in participants' perceived knowledge about performing a suicidality assessment ($Z = 6{,}186.00$, $p = < 0.001$) with participants reporting increased knowledge following participation in our curriculum. There was no significant effect of medical trainee level [$H\ (4) = 1.22$, $p = 0.88$) [$H\ (1) = 0.003$, $p = 0.96$) on difference scores.

Item 7: How Comfortable Do You Feel Discussing Thoughts/Feelings Around Suicidal Thoughts/Feelings/Behaviors in Children/Adolescents?

There was a significant difference pre- to post- training in participants' comfort discussing suicidal thoughts/feelings/behaviors in children/adolescents ($Z = 3{,}940.00$, $p = < 0.001$) with comfort increasing following participation in our curriculum. A significant effect of medical trainee level on difference scores [$H\ (4) = 9.57$, $p = 0.048$) was found. Pairwise comparisons revealed that MS I-II showed greater gains in comfort as compared to all other levels (all $p < 0.05$); no other pairwise comparisons were significant (all $p > 0.33$). However, a significant difference was found from pre- to post- training for MS I-II ($Z = 268.50$; $p < 0.001$), MS III ($Z = 136.00$; $p = 0.002$), MS IV ($Z = 394.00$; $p < 0.001$), PGY I ($Z = 66.00$; $p = 0.02$), and PGY I-III ($Z = 56.00$; $p = 0.03$), indicating that while MS-I-II showed greater gains, all participants rated comfort higher following participation in our curriculum.

All Items

There was no significant effect of specialty area on difference scores (all $p > 0.06$).

DISCUSSION

With an overall paucity internationally of CAP subspecialists (13–16, 34, 36) and the critical rates of pediatric depression and suicidality (1, 3, 4), there is a critical need for primary care clinicians to develop competency in screening and basic assessment of conditions traditionally managed by subspecialists, including mental and behavioral health disorders such as depression and suicidality (8, 14, 18, 19, 48, 57). To address this need, we developed our INVEST curriculum, a virtually-delivered, synchronous medical education program (8, 17, 19, 22, 24, 30, 40, 41) leveraging mixed technology (10) to bring subspecialty content to a diverse audience of medical students and residents. We applied our multimodal structure to focus on delivery of key skills in assessing pediatric depression and suicidality in the primary care setting (20, 50) through video modeled best practice with CAP subspecialist-led discussion. To our knowledge, this is the first curriculum that integrates multi-modal, active learning strategies (i.e., video modeling, interactive case discussion, virtual polling, subspecialty facilitation) in a fully virtual platform to deliver active education in CAP in a standard 60-min format. In creating our curriculum structure, concrete steps are demonstrated, discussed, and reviewed to address positive PHQ-9 screening results within an outpatient setting, serving as a guide for primary care learners in medical school and residency.

Outcome data collected across five waves of implementation suggests that, overall, medical students and residents experienced significant improvements in perceived knowledge and comfort with provision of care around pediatric depression and suicidality. As a result of the training, medical students reported significant improvement in awareness of pediatric depression as a clinical issue that is likely to be encountered regularly in the primary care setting. We found significant positive gains from pre- to post- training in medical students' and residents' perceived likelihood of encountering pediatric patients with suicidal ideation, knowledge about pediatric depression and suicidality, and comfort in administering and responding to depression screenings and suicidality assessment. While we failed to find differences in benefit of our curriculum across medical student intended specialty area, we did find an effect of medical learner level across a number of competency areas. Medical students and residents in lower educational levels generally reported the highest benefit. Specifically, medical students reported significant increases in their comfort interpreting and discussing positive depression screens and evidenced the greatest relative benefit in comfort with discussing suicidality. Together, these findings suggest that our curriculum may be particularly effective in preparing learners to enter clinical experiences where they may encounter patients with these behavioral health challenges (e.g., medical students before entering the outpatient setting, residents during orientation to training). While medical students reported greater gains in knowledge/comfort addressing suicidal thoughts/feelings/behaviors in pediatric patients, residents also endorsed perceived benefit. Interestingly, residents did endorse benefit from training in pediatric suicidality (items 2, 6, 7), suggesting that this may be a particular area of weakness for medical students and residents alike, consistent with findings from Fallucco et al. (17).

There are several possible reasons that more experienced learners (i.e., PGY2 or PGY3 residents) reported fewer gains from our curriculum, such as prior exposure to adult content or techniques (e.g., giving bad news) (29, 47, 49) in their clinical rotations, making depression content more familiar to them. It should be noted that in group discussion, resident level participants generally denied previous personal experience with pediatric patients showing symptoms of depression or suicidality. Additionally, evidence suggests that primary care graduates may perceive diagnosis and treatment of mental health issues as the responsibility of the subspecialist (19); as a result, they may have perceived the content as less relevant, impacting their own awareness of skills and attitudes in this area. It is possible as well that since the trainers were unknown to the residents and residents were required to attend the educational activity that there was more difficulty in building rapport in the virtual environment. Additionally, it should be noted that many residents who participated joined from their clinical service areas (e.g., hospital work room space) and may have had divided attention because of their caretaking responsibilities during the activity. It should be noted that in the cohort of medical students, a significant number of individuals were recruited via special interest groups. Therefore, the medical student audience may have been more willing to engage in the virtual training modality, as those individuals likely were already interested in the topics or population. These individuals also may have been more willing to report improvements in their understanding of the topics covered because of this interest.

Initial outcome data is promising, however there are several limitations to our approach that warrant discussion. First, outcomes were targeted to the learning objectives such that other needs/gains may have been missed. Further, outcomes were measured via participant self-report only, prohibiting study of objective change in clinical competence, and only pre- and immediate post-data was collected (total 2 data points). Collection of data at a third time point (i.e., follow-up) would strengthen the study and allow for generalization regarding maintenance of gains over time. Collection of qualitative information from participants as well as measures of engagement or related constructs from facilitators would have allowed for richer outcome data. While we did collect and analyze the effects of medical trainee level and intended specialty area, we did not collect demographic information on to minimize the burden of questionnaires for participants; this will be important in the future. Finally, further adaptation of our curriculum to teach pediatric depression and suicidality information is warranted. As all groups reported increased knowledge regarding suicidality topics, it may be beneficial to focus on this topic through development of a stand-alone module, emphasize the relationship between depression and suicidality, and/or share common content misconceptions.

Benefits and Challenges of Virtual Delivery of Medical Education

Our curriculum provided learners with a succinct introduction to a complex topic with multi-modal and activity learning strategies. Participants additionally had the opportunity to have direct contact with CAP subspecialists, who would otherwise have been inaccessible during their medical trainee years (11, 12). While CAP subspecialist time was still required for the 60 min trainings, the overall time required was minimized by eliminating travel (+2 h to some sites) and development of a multimodal (20, 22, 42) structure (i.e., videos, polling), which allowed the CAP educator to customize conversations and discussion to the needs of the attendees while optimizing individual efforts. Using CAP subspecialists for medical training in this way may increase primary care workforce competence in subspecialty areas with low access/high need. CAP subspecialists are particularly well-equipped to address very challenging cases brought by more senior learners (PGY2 or PGY-3) to discussion, build pediatric content on the foundation.

An additional strength of our curriculum is the completely virtual delivery paired with synchronous teaching and direct engagement with CAP subspecialists (22, 37, 40). This educational format provides the opportunity for active (20, 37, 38) learning while individuals remain socially distanced, a necessity during the time of COVID-19. The virtual format also expands educational reach to diverse geographic locations, across programs or institutions, as well as across education levels or specialty areas. Though our curriculum was delivered to medical students and residents, the format can be applied to continuing medical education around subspecialty topics, including new or updated best practices for established providers.

Despite clear benefits to developing and deploying virtual medical education curricula, unique challenges exist for educators. For instance, participants may tune in from disruptive environments (e.g., while driving or from shared clinical workspace). We found that medical students and residents who shared a log-in or who joined without video were less likely to actively participate with the group and did not add comments or questions verbally or via chat box. Engagement was enhanced when participants were provided with instructions about the virtual platform prior to the training, including the directive to log on individually with camera and microphone. Additionally, the co-facilitator significantly contributed to engagement by sharing technical information, initiating, and elaborating on discussion topics, and managing participation via the virtual platform chat box.

Future Directions

In the future, it will be important to measure changes in clinical competency following engagement in our curriculum. Other training programs have used post-training online cases with virtual patients (58) or standardized patient-based simulation (48, 59) as a means of observing clinician skill development. Chart review of referral practice, screening tool use or other skills could be another means of looking at practice changes following training and could be made into a senior level quality improvement project for practices or residents. Further, as discussed by Cook, Bordage, & Schmidt, investigation is also needed around how the multimodal format of our curriculum directly compares to other training methods addressing pediatric depression and suicidality (39). In particular, traditional didactic and more active formats like patient-based simulation should be compared, as well as objective examination of the mechanisms of learning change following engagement in the curriculum.

Future adaptations of our curriculum should target other high-need areas for primary care, including other content areas such as Autism Spectrum Disorder or Intellectual Disability or to enhance psychosocial skill training across diagnoses in the clinical environment [e.g., see Roter et al. (23) for further description of how teaching communication and psychosocial skills to address patient psychosocial distress can improve resident diagnostic accuracy and management]. Finally, our curriculum could be expanded to address practice quality improvement issues (e.g., implementing screening tools into practice) while addressing concerns about time and reimbursement [e.g., see Horwitz et al. (18)].

To improve our model, additional methods of content building, particularly for senior level residents (PGY-2 or PGY-3), and engagement must be considered. Senior level residents may benefit from additional responsibility during training, such as by bringing clinical examples, relating material to specific clinic encounters, directing learning with prepared questions, or taking the place of the co-facilitator to support discussion and technical assistance. Our curriculum could also be integrated with other forms of skill application for senior level residents, such as through facilitated role play, recorded encounters with subsequent self-rated practice (17, 20, 41), pediatric simulation (60), or unannounced standardized patients (20, 21) for formative or summative assessment (7, 28). Further, residents may be better engaged with other adaptations, such as inclusion of a familiar faculty member or a more senior resident, in order to more effectively support trainees in their exploration of knowledge gaps or feelings of vulnerability regarding difficult cases. Integrating additional tools such as skills checklists for observers to complete while viewing the video models (9, 17, 21, 27, 41) may also enhance engagement.

CONCLUSIONS

Given the international dearth of CAP subspecialists, medical professionals will ultimately be faced with assessing and treating conditions traditionally managed by these clinicians. Thus, it is critical to develop and test effective, efficient, and financially feasible methods of training in these areas. To our knowledge, our curriculum "INVEST" is the first fully virtual, synchronous multimodal curriculum led by expert subspecialists in the CAP field which adheres to a traditional 60-min format. Our findings suggest that our curriculum shows promise for equipping medical students and residents with baseline knowledge when piloted to teach pediatric depression and suicidality. While further adaptation and evaluation is necessary, it is our hope that our curriculum framework can serve as a model for a

broad array of virtual medical education content areas, with the ultimate goal of building medical students' and residents' interest and competence in primary care as well as underserved pediatric subspecialties.

[1]https://projectteachny.org/resources/

[2]https://toolkits.solutions.aap.org/mental-health/home

[3]https://www.phqscreeners.com/images/sites/g/files/g10060481/f/201412/PHQ-9_English.pdf

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Indiana University IRB reference number 2001953926A001. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

MC, JD, and AH developed and provided all trainings. MC drafted the initial manuscript and took primary responsibility for the manuscript development. EC managed all REDcap development and management and contributed to manuscript editing. BE and RM conducted data analysis and interpretation. AH, BE, and RM provided critical review and intellectual contributions to all manuscript drafts. All authors contributed to the article and approved the submitted version.

FUNDING

Clinician salary support for this research came through the Riley Childrens Foundation and Kiwanis Indiana Three Wishes Campaign for MC. RM time was supported by the Robert and Helen Haddad Family Foundation Scholarship and the Riley Children's Foundation.

ACKNOWLEDGMENTS

Our team is grateful to the mentorship of Dr. Mary Ciccarelli, director of the Kiwanis Indiana Three Wishes Campaign team, and for the collaboration of teaching programs in the state of Indiana who allowed our team to bring this model to their trainees: IU Arnett Family Medicine Residency, Indiana University School of Medicine Family Medicine Residency at Memorial Hospital And Health Care Center, IU Health Ball Family Medicine Residency, IU Methodist Family Medicine Residency, and Marian University College of Osteopathic Medicine. We would like to also thank Indiana University's Instructional Technology team and Simulation Center for making these video models possible.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.671442/full#supplementary-material

REFERENCES

1. Erskine HE, Baxter AJ, Patton G, Moffitt TE, Patel V, Whiteford HA, et al. The global coverage of prevalence data for mental disorders in children and adolescents. *Epidemiol Psychiatr Sci.* (2017) 26:395–402. doi: 10.1017/S2045796015001158
2. US Food & Drug Administration. *Don't Leave Childhood Depression Untreated*. Available online at: https://www.fda.gov/consumers/consumer-updates/fda-dont-leave-childhood-depression-untreated (accessed May 12, 2021).
3. Kessler RC, Avenevoli S, Ries Merikangas K. Mood disorders in children and adolescents: an epidemiologic perspective. *Biol Psychiatry.* (2001) 49:1002–14. doi: 10.1016/S0006-3223(01)01129-5
4. World Health Organization. *Suicide*. Available online at: https://www.who.int/news-room/fact-sheets/detail/suicide (accessed May 5, 2021).
5. Dervic K, Brent DA, Oquendo MA. Completed suicide in childhood. *Psychiatr Clin North Am.* (2008) 31:271–91. doi: 10.1016/j.psc.2008.01.006
6. Fegert JM, Vitiello B, Plener PL, Clemens V. Challenges and burden of the Coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: a narrative review to highlight clinical and research needs in the acute phase and the long return to normality. *Child Adolesc Psychiatry Ment Health.* (2020) 14. doi: 10.1186/s13034-020-00329-3
7. Kaltman S, Talisman N, Pennestri S, Syverson E, Arthur P, Vovides Y. Using technology to enhance teaching of patient-centered interviewing for early medical students. *Simul Healthc.* (2018) 13:188–94. doi: 10.1097/SIH.0000000000000304
8. Cole S, Raju M, Barrett J, Gerrity M, Dietrich A. The macarthur foundation depression education program for primary care physicians: background and rational. *Gen Hosp Psychiatry.* (2000) 22:299–358. doi: 10.1016/S0163-8343(00)80007-9
9. Niebruegge B, Holbrook JM, Vernon C, Grotton C, Maric A. The future of population medicine: investigating the role of advanced practice providers and simulation education in special patient populations. *Dis Mon.* (2019) 65:24. doi: 10.1016/j.disamonth.2018.09.005
10. Moran J, Briscoe G, Peglow S. Current technology in advancing medical education: perspectives for learning and providing care. *Acad Psychiatry.* (2018) 42:796–9. doi: 10.1007/s40596-018-0946-y
11. American Academy of Child and Adolescent Psychiatry. *Workforce Maps by State*. Available online at: https://www.aacap.org/aacap/Advocacy/Federal_and_State_Initiatives/Workforce_Maps/Home.aspx (accessed July 21, 2020).
12. Freed GL, Moran LM, Van KD, Leslie LK. Current workforce of pediatric subspecialists in the United States. *Pediatrics.* (2017) 139:e20163604. doi: 10.1542/peds.2016-3604
13. Keller DM, Davis MM, Freed GL. Access to pediatric subspecialty care for children and youth: possible shortages and potential solutions. *Pediatr Res.* (2020) 87:1151–2. doi: 10.1038/s41390-020-0889-3
14. Skokauskas N, Fung D, Flaherty LT, von Klitzing K, Puras D, Servili C, et al. Shaping the future of child and adolescent psychiatry. *Child Adolesc Psychiatry Ment Health.* (2019) 13:1–7. doi: 10.1186/s13034-019-0279-y
15. Shugerman R, Shipman S, Cull W, Rimsza M, O'Connor K, Pletcher B. *Too Many, Too Few, or Just Right? A National Survey of Practicing Pediatricians Assessing the Pediatric Subspecialty Supply*. Honolulu: Pediatric Academic Societies Annual Meeting (2008).

16. Steinman KJ, Shoben AB, Dembe AE, Kelleher KJ. How long do adolescents wait for psychiatry appointments? *Community Ment Health J.* (2015) 51:782–9. doi: 10.1007/s10597-015-9897-x
17. Fallucco EM, Hanson MD, Glowinski AL. Teaching pediatric residents to assess adolescent suicide risk with a standardized patient module. *Pediatrics.* (2010) 125:9. doi: 10.1542/peds.2009-2135
18. Horwitz SM, Storfer-Isser A, D KB, Szilagyi M, Garner A, O'Connor KG, et al. Barriers to the identification and management of psychosocial problems: Changes from 2004 to 2013. *Acad Pediatr.* (2015) 15:613–20. doi: 10.1016/j.acap.2015.08.006
19. Ballester DA, Filippon AP, Braga C, Andreoli SB. The general practitioner and mental health problems: challenges and strategies for medical education. *São Paulo Med J.* (2005) 123:72–6. doi: 10.1590/S1516-31802005000200008
20. Ross PT, Fitzgerald JT, Ravindranath D, Pfeiffer PN, Singh MK, Weiner SJ, et al. Assessing residents' veteran-centered care skills in the clinical setting. *J Grad Med Educ.* (2018) 10:279–84. doi: 10.4300/JGME-D-17-00700.1
21. Zabar S, Hanley K, Watsula-Morley A, Goldstein J, Altshuler L, Dumorne H, et al. Using unannounced standardized patients to explore variation in care for patients with depression. *J Grad Med Educ.* (2018) 10:285–91. doi: 10.4300/JGME-D-17-00736.1
22. Hodges B, Inch C, Silver I. Improving the psychiatric knowledge, skills, and attitudes of primary care physicians, 1950-2000: a review. *Am J Psychiatry.* (2001) 158:1579–86. doi: 10.1176/appi.ajp.158.10.1579
23. Roter DL, Cole KA, Kern DE, Barker LR, Grayson M. An evaluation of residency training in interviewing skills and the psychosocial domain of medical practice. *J Gen Intern Med.* (1990) 5:347–54. doi: 10.1007/BF02600404
24. Dubosh NM, Hall MM, Novack V, Shafat T, Shapiro NI, Ullman EA. A multimodal curriculum with patient feedback to improve medical student communication: pilot study. *West J Emerg Med.* (2020) 21:115–21. doi: 10.5811/westjem.2018.11.44318
25. Vandekieft GK. Breaking bad news. *Am Fam Physician.* (2001) 64:1975–9.
26. Freed GL, Dunham KM, Switalski KE, Jones Jr MD, McGuinness GA. Recently trained general pediatricians: perspectives on residency training and scope of practice. *Pediatrics.* (2009) 123:S38–43. doi: 10.1542/peds.2008-1578J
27. Langewitz WA, Eich P, Kiss A, Wossmer B. Improving communication skills—a randomized controlled behaviorally oriented intervention study for residents in internal medicine. *Psychosom Med.* (1998) 60:268–78. doi: 10.1097/00006842-199805000-00009
28. O'Sullivan P, Chaos S, Russell M, Levine S, Fabiny A. Development and implementation of an objective structured clinical examination to provide formative feedback on communication and interpersonal skills in geriatric training. *J Am Geriatr Soc.* (2008) 56:1730–5. doi: 10.1111/j.1532-5415.2008.01860.x
29. Fujimori M, Shirai Y, Kubota K, Katsumata N, Uchitomi Y. Effect of communication skills training program for oncologists based on patient preferences for communication when receiving bad news: a randomized control trial. *J Clin Oncol.* (2014) 32:2166–72. doi: 10.1200/JCO.2013.51.2756
30. Ditton-Phare P, Sandhu H, Kelly B, Kissane D, Loughland C. Pilot evaluation of a communication skills training program for psychiatry residents using standardized patient assessment. *Acad Psychiatry.* (2016) 40:768–75. doi: 10.1007/s40596-016-0560-9
31. Zuckerbrot RA, Cheung A, Jensen PS, Stein REK, Laraque D. GLAD-PC STEERING GROUP. Guidelines for Adolescent Depression in Primary Care (GLAD-PC): Part I. Practice preparation, identification, assessment, and initial management. *Pediatrics.* (2018) 141:e20174081. doi: 10.1542/peds.2017-4081
32. Horowitz LM, Bridge JA, Teach SJ, Ballard E, Klima J, Rosenstein DL, et al. Ask suicide-screening questions (ASQ): a brief instrument for the pediatric emergency department. *Arch Pediatr Adolesc Med.* (2012) 166:1170–6. doi: 10.1001/archpediatrics.2012.1276
33. Jensen PS, Kratochvil C, Laraque DL, Stein REK. *Basic science-guided coaching of primary care providers, in Scientific Proceedings of the Annual Meetings, American Academy of Child & Adolescent Psychiatry.* Toronto: American Academy of Child & Adolescent Psychiatry (2011).
34. Bridgemohan C, Bauer NS, Nielson BA, DeBattista A, Ruch-Ross HS, Paul LB, et al. A workforce survey on developmental-behavioral pediatrics. *Pediatrics.* (2018) 141:e20172164. doi: 10.1542/peds.2017-2164
35. Martini R, Hilt R, Marx L, Chenven M, Naylor M, Sarvet B, et al. Best Principles for Integration of Child Psychiatry into the Pediatric Health Home. *Am Acad Child Adol Psychiatry.* (2012).
36. International association for child and adolescent psychiatry and allied professions. Declaration of the consortium for global infant, child and adolescent mental health. Available online at: https://iacapap.org/content/uploads/Declaration_GlobalInfant.pdf (accessed April 28, 2021).
37. Prince M. Does active learning work? A review of the research. *J Engr Educ.* (2004) 93:223–31. doi: 10.1002/j.2168-9830.2004.tb00809.x
38. Issenberg SB, Mcgaghie WC, Petrusa ER, Gordon DL, Scalese RJ. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med Teach.* (2005) 27:10–28. doi: 10.1080/01421590500046924
39. Cook DA, Bordage G, Schmidt HG. Description, justification and clarification: a framework for classifying the purposes of research in medical education. *Med Educ.* (2008) 42:128–33. doi: 10.1111/j.1365-2923.2007.02974.x
40. Harris Jr JM, Sun H. A randomized trial of two e-learning strategies for teaching substance abuse management skills to physicians. *Acad Med.* (2013) 88:1357–62. doi: 10.1097/ACM.0b013e31829e7ec6
41. O'Brien R, Goldberg SE, Pilnick A, Beeke S, Schneider J, Sartain K, et al. The VOICE study - a before and after study of a dementia communication skills training course. *PLoS ONE.* (2018) 13. doi: 10.1371/journal.pone.0198567
42. Ahn J, Martin SK, Farnan JM, Fromme HB. The graduate medical education scholars track: developing residents as clinician-educators during clinical training via a longitudinal, multimodal, and multidisciplinary track. *Acad Med.* (2018) 93:214–9. doi: 10.1097/ACM.0000000000001815
43. Baccolini V, D'Egidio V, de Soccio P, Migliara G, Massimi A, Alessandri F, et al. Effectiveness over time of a multimodal intervention to improve compliance with standard hygiene precautions in an intensive care unit of a large teaching hospital. *Antimicrob Resist Infect Control.* (2019) 8:92. doi: 10.1186/s13756-019-0544-0
44. Duff B, Massey D, Gooch R, Wallis M. The impact of a multimodal education strategy (the DeTER program) on nurses' recognition and response to deteriorating patients. *Nurse Educ Pract.* (2018) 31:130–5. doi: 10.1016/j.nepr.2018.05.011
45. Ghezeljeh TN, Abbasnejad Z, Rafii F, Haghani H. Effect of a multimodal training program on traditional lecture method on nurses' hand hygiene knowledge, belief, and practice: a brief report. *Am J Infect.* (2015) 43:762–4. doi: 10.1016/j.ajic.2015.03.018
46. Lorio AK, Gore JB, Warthen L, Housley SN, Burgess EO. Teaching demetia care to physical therapy doctoral students: a multimodal experiential learning approach. *Gerontol Geriatr Educ.* (2017) 38:313–24. doi: 10.1080/02701960.2015.1115979
47. Kawamura A, Mylopoulos M, Orsino A, Jimenez E, McNaughton N. Promoting the development of adaptive expertise: exploring a simulation model for sharing a diagnosis of autism with parents. *Acad Med.* (2016) 91:1576–81. doi: 10.1097/ACM.0000000000001246
48. Blashki GA, Piterman L, Meadows GN, Clarke DM, Prabaharan V, Gunn JM, et al. Impact of an educational intervention on general practitioners' skills in cognitive behavioural strategies: a randomised controlled trial. *Med J Aust.* (2008) 188:S129–32. doi: 10.5694/j.1326-5377.2008.tb01876.x
49. Detering K, Silvester W, Corke C, Milnes S, Fullam R, Lewis V, et al. Teaching general practitioners and doctors-in-training to discuss advance care planning: evaluation of a brief multimodality education programme. *BMJ Support Palliat.* (2014) 4:313–21. doi: 10.1136/bmjspcare-2013-000450
50. Douglas SR, Vides de Andrade AR, Boyd S, Leslie M, Webb L, Davis L, et al. Communication training improves patient-centered provider behavior and screening for soldiers' mental health concerns. *Patient Educ Couns.* (2016) 99:1203–12. doi: 10.1016/j.pec.2016.01.018
51. Louie E, Giannopoulos V, Baillie A, Uribe G, Byrne S, Deady M, et al. Translating evidence-based practice for managing comorbid substance use and mental illness using a multimodal training package. *J Dual Diagn.* (2018) 14:111–9. doi: 10.1080/15504263.2018.1437496
52. Clapper TC. Beyond Knowles: what those conducting simulation need to know about adult learning theory. *Clin Simul Nurs.* (2010) 6:e7–14. doi: 10.1016/j.ecns.2009.07.003

53. Taylor DC, Hamdy H. Adult learning theories: implications for learning and teaching in medical education: AMEE Guide No. 83. *Med Teach.* (2013) 35:e1561–72. doi: 10.3109/0142159X.2013.828153
54. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* (2009) 42:377–81. doi: 10.1016/j.jbi.2008.08.010
55. Harris PA, Taylor R, Minor BL, Elliot V, Fernandez M, O'Neal L, et al. The REDCap consortium: building an international community of software platform partners. *J Biomed Inform.* (2019) 95:103208. doi: 10.1016/j.jbi.2019.103208
56. IBM Corp. *IBM SPSS Statistics for Windows.* Version 24.0. Armonk, NY: IBM Corp (2016).
57. De Leo D, Draper BM, Snowdon J, Kolves K. Contacts with health professionals before suicide: missed opportunities for prevention? *Compr Psychiatry.* (2013) 54:1117–23. doi: 10.1016/j.comppsych.2013.05.007
58. Lehmann R, Hanebeck B, Oberle S, Simon A, Choukair D, Tönshoff B, et al. Virtual patients in continuing medical education and residency training: a pilot project for acceptance analysis in the framework of a residency revision course in pediatrics. *GMS J Med Educ.* (2015) 32:9. doi: 10.3205/zma000993
59. Dudas R, Colbert-Getz J, Balighian E, Cooke D, Golden W, Khan S, et al. Evaluation of a simulation-based pediatric clinical skills curriculum for medical students. *Simul Healthcare.* (2014) 9:9. doi: 10.1097/SIH.0b013e3182a89154
60. Brown R, Doonan S, Shellenberger S. Using children as simulated patients in communication training for residents and medical students: a pilot program. *Acad Med.* (2005) 80:1114–20. doi: 10.1097/00001888-200512000-00010

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.

Advantages of publishing in Frontiers

OPEN ACCESS
Articles are free to read for greatest visibility and readership

FAST PUBLICATION
Around 90 days from submission to decision

HIGH QUALITY PEER-REVIEW
Rigorous, collaborative, and constructive peer-review

TRANSPARENT PEER-REVIEW
Editors and reviewers acknowledged by name on published articles

Frontiers
Avenue du Tribunal-Fédéral 34
1005 Lausanne | Switzerland

Visit us: www.frontiersin.org
Contact us: frontiersin.org/about/contact

REPRODUCIBILITY OF RESEARCH
Support open data and methods to enhance research reproducibility

DIGITAL PUBLISHING
Articles designed for optimal readership across devices

FOLLOW US
@frontiersin

IMPACT METRICS
Advanced article metrics track visibility across digital media

EXTENSIVE PROMOTION
Marketing and promotion of impactful research

LOOP RESEARCH NETWORK
Our network increases your article's readership