Supporting the recovery of individuals living with severe mental illness (SMI) requires clinicians to contend with significant complexity. Patient-level factors such as treatment-refractory illness, concurrent substance use, comorbid physical health problems, and low levels of engagement interact with numerous social and structural barriers to health such as racism, poverty, and homelessness to create ambiguous, complex clinical problems that require creativity and flexibility to solve. For example, an approach to diagnosis and treatment for someone experiencing a first episode of psychosis that might work well for a middle-class cis-gendered white person with good social supports may fail with someone who has survived significant childhood and racial trauma by using substances all their life and is now unhoused. Yet, psychiatrists must deliver excellent care in the face of clinical complexity that increasingly resembles the latter situation more than the former.

Theories of adaptive expertise suggest an approach to preparing trainees to successfully master such complexity. In this theorization, routine experts, who can apply facts and procedural knowledge to efficiently and correctly handle known problems within their domain of expertise, are distinguished from adaptive experts, who are able to go beyond routine expertise by generating new solutions to novel, ambiguous, and/or complex problems. Emerging literature indicates that adaptive experts respond effectively to novel, ambiguous, and/or complex problems by adapting and transferring their understanding of context-specific first principles and mechanisms to innovate novel solutions when these are needed [1]. Adaptive experts are theorized to also have a positive mindset toward learning, a high degree of intrinsic motivation and an openness to multiple perspectives [2]. Returning to the above example of first episode psychosis, while the routine expert may efficiently identify an effective approach for the first individual, the adaptive expert could also flexibly and creatively generate a customized approach to successfully engage and support the second individual.

Recognizing the relevance of the concept of adaptive expertise to the complexity of working with people living with SMI, we designed a novel case-based course for psychiatry residents with the goal of supporting the development of adaptive expertise in working with this population. In this paper, we describe the design and development of the course, and we highlight lessons learned from the first 2 years of its implementation.

Context and Rationale

The General Adult Psychiatry residency program at the University of Toronto includes approximately 200 residents located at nine core, four affiliated, and 20 community sites. The impetus for the development of this course was a whole-program curriculum renewal prompted by our program’s transition to a competency-based structure [3]. These changes prompted a redesign of the formal curriculum embedded in the block of training focused on the care of people living with SMI, a curriculum that previously consisted of 30 h of formal lectures delivered monthly during full academic days away from clinical duties. While those lectures were highly rated, resident attendance was inconsistent, and the well-known limitations of full days of lectures in achieving long-term learning outcomes prompted us to consider alternatives.

Case-based learning is an approach that aims to prepare students for clinical practice by using authentic clinical cases...
that link theory to practice and draw on inquiry-based learning methods [4]. Case-based learning is different from classical problem-based learning in that learners are more actively guided in their inquiry through the provision of clear learning objectives at the start of the case and more active direction by the tutor [5]. Both approaches leverage the well-established benefits of active learning [6]. While there are a handful of reports describing problem-based learning in postgraduate psychiatric education [7–10], we could not find any published examples of case-based learning in this setting. Nevertheless, we chose to replace the monthly lectures with a weekly, case-based course for several reasons: (1) small group tutorials could create conditions for more active learning; (2) shorter, more frequent classes could support improved focus and concentration; (3) more frequent meetings could prompt residents to connect theory with practice more frequently; (4) carefully developed cases could enable a more intentional formal curriculum, avoiding the gaps and redundancies that had been noted in resident feedback; and (5) the more directive case-based approach was felt to be more suitable for senior residents who have limited time for the inquiry of the more open-ended process of problem-based learning.

We adapted case-based learning to support the development of adaptive expertise by incorporating several key features into the design of the course [11]. First, we invited the learners to approach each case without specific prior preparation, thus engaging learners in a process of productive failure [12], wherein residents are invited to struggle while comprehending and solving the clinical problems associated with the case. They identify and fill in knowledge gaps through discussion with their peers and tutors and review of the provided resources after the initial case discussions and prior to the case being taken up again the following week. This sequencing of instruction, which differs from typical case-based learning and the “flipped classroom,” where learners come to class having prepared in advance, is thought to create a powerful time for telling [13], as learners personally experience failure and are motivated to address their knowledge gaps. Second, we prompted the tutors to ask “why” questions to encourage the acquisition of conceptual knowledge through the learning of mechanisms that span the full biopsychosocial-structural spectrum. Third, we encouraged tutors and residents to expand out from the cases and consider meaningful variation in important clinical variables by prompting tutors to pose “what if” questions and encouraging residents to share related examples from their clinical practice. By asking participants to consider important differences in clinical presentations, therapeutic approaches, and outcomes between similar clinical cases, we thus encourage understanding of the underlying concepts and mechanisms, enhancing retention and transfer of knowledge [1]. Fourth, we asked the tutors to adopt a stance of curiosity and humility in the face of clinical complexity, modeling for residents the lifelong learning habits that are characteristic of adaptive experts.

In parallel with the transition to a competency-based structure [14], our program has also sought to strengthen social justice and health equity teaching throughout the curriculum, ultimately aiming to support the acquisition of structural competence [15]. Thus, in addition to core biomedical learning objectives, we included learning objectives that would serve to highlight the intersecting psychosocial issues that commonly and negatively affect people living with SMI, such as poverty, homelessness, trauma, racism, and discrimination based on gender and sexuality. Our intention was for residents to encounter social justice and health equity topics as integral aspects of routine clinical practice, rather than as standalone topics [16], while building from and foreshadowing more immersive coverage of these topics in other parts of the residency curriculum. For example, case 6 invites residents to extend knowledge about racism (covered both earlier and later in the residency curriculum) to consider the specific ways that anti-Black racism affects individuals living with SMI.

Learning Objectives and Cases

In consultation with the previous lecturers and other key faculty members, we developed 27 learning objectives that span the biological, psychological, social, and structural domains (see Table 1). These objectives were written to align with the competencies set out by the Royal College of Physicians and Surgeons of Canada [17] and are in close alignment with the Accreditation Council for Graduate Medical Education psychiatry milestones framework [18]. Our learning objectives build on related, more basic knowledge (e.g., about schizophrenia and antipsychotic medications) covered in earlier years of training. The objectives were combined and sequenced to form the basis of nine fictional cases, which were principally authored by SA, with input from seventeen local faculty content experts. The cases were designed to present core clinical challenges that are commonly (but not universally) encountered during this rotation, paying particular attention to the complex interactions between biological, psychological, social and structural factors. The cases were also fine-tuned to conform with emerging best practices for addressing race, culture, and structural inequity in teaching cases [19]. Figure 1 provides an excerpt of a case that illustrates some key design features.

Format

Residents meet weekly in small groups with a faculty tutor for 1.5 h for 11 weeks. They start by reading through the first part of a case without prior preparation. Residents are encouraged to drive the tutorial themselves by posing questions and formulating responses. The tutor facilitates the learning using the specific strategies described above that foster the development
of adaptive expertise. The tutor also supports the residents through difficult conversations that can emerge when discussing the social and structural determinants of health using an approach described as dialogue [20]. After the first part of the case is thoroughly discussed, residents are encouraged to review key resources (review articles, primary empirical literature, essays, websites, and video clips) prior to returning the following week to discuss and apply the information gleaned from the resources and complete the case.

| Week | Objective 1 | Objective 2 | Objective 3 |
|------|-------------|-------------|-------------|
| 1    | Early intervention | Metabolic side effects | Recovery-oriented health services |
| 2    | Injectable antipsychotics | Community treatment orders | Extra-pyramidal side effects |
| 3    | Violence | Clozapine | LGBTQ2S considerations |
| 4    | Trauma | Ultra-treatment resistance | CBT for psychosis |
| 5    | Negative and cognitive symptoms | Psychosocial rehabilitation | Schizophrenia neuroscience |
| 6    | Cannabis and schizophrenia | Tardive dyskinesia | Anti-Black racism |
| 7    | Poverty and homelessness | Indigenous health considerations | Suicide |
| 8    | Intellectual disability and psychosis | Tobacco | Migration and minority status |
| 9 and 10 | Bipolar disorder—pharmacotherapy | Bipolar disorder—psychosocial interventions | Measurement-based care |

**Implementation**

A preliminary version of the course was piloted in 2019/2020, with a small cohort of 7 residents divided into four groups of two residents (or, in one case, one resident) each. Tutorials were initially held in person but were moved to a virtual platform in March 2020 in response to the COVID-19 pandemic. The initial informal feedback from residents was consistently positive, spurring the development of more cases and the...
recruitment of more tutors (LW, ML, and SL), who are junior, mid-career, and senior psychiatrists specialized in working with people living with SMI. In 2020/2021 the course was delivered to a full cohort of 44 residents, who were divided into three successive sets of two parallel small groups of 6 to 8 residents each. By gathering input from residents and tutors through electronic surveys, and through regular meetings with tutors, the course has thus been iteratively improved over seven cycles involving a total of 51 residents and 4 tutors. After a planned annual review by the original content experts to ensure that the cases and resources are up to date, the course is presently being delivered to a cohort of 44 residents enrolled in the 2021/2022 academic year, with three new junior faculty tutoring alongside the original four.

Discussion

In this paper, we describe the development and implementation of a novel case-based course for residents designed to facilitate the development of adaptive expertise in working with people experiencing SMI. The course thus aims to go beyond the benefits of active learning that can be achieved through case-based learning by using a range of instructional strategies that specifically support the development of adaptive expertise, including creating conditions for productive failure, emphasizing mechanisms, and leveraging meaningful variation. By embedding the objectives into a series of carefully constructed fictional cases, we invite our learners to consider the complex interplay between various bio-psychosocial-structural factors that shape the lives and recovery journeys of our patients, thus helping them to understand patients’ experience of illness in the context of structural factors, and, in doing so, building structural competence. In addition, by delivering the course through small group tutorials, we create opportunities for learners to actively engage with new knowledge with the support of each other and their tutor guide, thus building the intrinsic motivation, reflective capacity, communication, and collaboration skills that are thought to enable adaptive expertise [2].

Our approach to supporting adaptive expertise, one of the key innovations of this course, has proven to be feasible in our postgraduate education context, and, consistent with other case-based learning literature [4], has been positively received by residents and tutors alike. Residents have expressed strong and consistent appreciation for the opportunity to engage in rich discussions and dialogue with their peers and tutors. Particularly as the COVID-19 pandemic has upended all our lives in many ways, the tutorials have emerged as an important opportunity for residents to share clinical questions with their peers and feel validated in their clinical struggles. For their part, tutors have consistently expressed a strong appreciation for the experience of facilitating small, longitudinal groups and have realized an unanticipated benefit of deriving substantial clinical learning from the readings and discussions, helping them to build their own adaptive expertise.

On the other hand, the time required to read through the provided resources has challenged many residents, a finding that may reflect a significant difference from the undergraduate medical education context, where learners expect to spend a significant amount of time studying outside of class. This invisible labor has perhaps felt particularly onerous given the impact of the pandemic on residents’ work and personal lives. Addressing this challenge will require changes in the postgraduate learning environment to enable more of this important work of learning to occur during a manageable work week.

While we have carefully designed our course to support the development of adaptive expertise, we acknowledge that we do not yet have empirical evidence that it has achieved this goal. We recognize that positive reactions from residents and tutors do not necessarily mean that residents are learning more than they did from 30 h of lectures, nor that they are more ready to handle ambiguous, novel, and/or complex problems in the workplace. Further, it is possible that our course, paradoxically, has only served, through time spent away from clinical work, to reduce opportunities to engage in the richer, more authentic learning that occurs in the workplace. Unfortunately, there is a noted gap in the literature of real-world interventions that have been shown to support the development of adaptive expertise in health professions education [2], and we therefore have few practical analogues to draw from. Therefore, for now, we rely on the first principles of educational design drawn from the educational science reviewed above to explain the rationale and argue the merits of our course. Future research will need to rigorously explore when and how our course supports the development of adaptive expertise in the real-world setting.

Acknowledgements The authors would like to thank the residents who offered feedback on the course.

Funding SA was supported in part by an Academic Scholars Award from the Department of Psychiatry, University of Toronto.

Declarations

Disclosures On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethics Approval This work was exempted for full review by the University of Toronto Health Sciences Research Ethics Board.

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