MINDS@WORK – A NEW MANUALIZED INTERVENTION TO IMPROVE JOB TENURE IN PSYCHOSIS BASED ON SCOPING REVIEW AND LOGIC MODEL

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Abstract

Introduction

A significant proportion of people experiencing psychosis are unemployed, despite a strong desire to work. Current supported employment programs appear effective in helping them obtain employment, yet job tenure remains an arduous challenge. The objective of this study was to review the literature and model the results to inform the development of a new manualized group psychosocial intervention – '*Minds@Work*' – aimed specifically at improving job tenure in psychosis.

Methods

The study was registered on the Open Science Framework platform (https://osf.io/he68z). The literature was searched in Medline, Embase, PsycInfo and Cochrane Library databases for studies examining predictors of job tenure in psychosis and existing occupational psychosocial interventions. Data were extracted using a pre-established form and synthesized using logic models.

Results

A total of 94 studies were included and their findings were modeled using different categories: intervention typologies, mechanisms of action, predictors of job tenure, outcomes and contextual factors. The '*Minds@Work*' program was built based on these modeled findings and aimed to target specific predictors of job tenure while addressing some of the limitations of existing interventions. The program uses evidence-based techniques and is divided into 9 modules covering 4 themes: positive psychology (motivation, character strengths, self-compassion), neurocognitive remediation (attention, memory, problem-solving), cognitive biases training (jumping to conclusions, defeatists beliefs, theory of mind, attributional styles) and socioemotional coping skills (emotion regulation, communication).

Conclusions

Once validated, this new program is meant to be used either as a stand-alone intervention or integrated in supported employment initiatives, by employment specialists or healthcare workers.

Keywords: systematic review, schizophrenia, work, employment, therapeutics

1. Introduction

Psychotic disorders, which include schizophrenia, are pervasive psychiatric conditions that greatly impact functioning. It has been observed that the vast majority (80%) of people with psychosis are unemployed despite a strong desire to work [1, 2]. Further, job tenure currently represents an arduous challenge since the average duration of employment for people with psychosis is 8 months, compared to 9 years in the general population [3, 4]. Current psychosocial interventions aimed at improving occupational functioning in psychosis have yet to increase these unsatisfactory figures [4-6]. Therefore, there is a pressing need to develop novel interventions that integrate the most effective components of existing psychosocial approaches. In this paper, we present a new manualized group psychosocial intervention specifically aimed at improving job tenure in psychosis. This novel program, entitled '*Minds@Work*', was developed with the objective of addressing some of the limitations of current occupational interventions.

Over the past decades, many types of supported employment (SE) programs have been developed and tested. Traditional SE, such as *Individual and Placement Support* (IPS), focus on rapid job search in the competitive market and include continuous clinical support [7]. More recently, SE programs have been augmented (SE+) with additional components, like *Cognitive Remediation Therapy* [8] or *Cognitive Behavioral Therapy* [9]. These research and clinical efforts have emerged following the consistent observation that multiple factors impact job tenure in psychosis. Among others, these predictors include: cognitive and social skills deficits, negative symptoms (e.g., amotivation), scarcity of work accommodations, and lack of support inside and outside the workplace [10-15]. Interestingly, a recent Cochrane review suggested that SE+ outperform traditional SE programs in terms of job tenure [4].

However, these reviewed SE+ programs present several limitations. *First*, they are most often augmented with stand-alone therapies (e.g., cognitive remediation therapy), for which the exercises have not necessarily been adapted to the occupational context. For example, some SE+ programs consist of traditional vocational aid (e.g., IPS) supplemented by weekly sessions of typical computer-assisted cognitive remediation therapy (i.e., pre-programmed exercises designed to improve elementary neurocognitive functions). It has been argued that such interventions limit participants' knowledge and skills transfer to their work environment [16]. *Second*, interventions most often combined SE programs with only one stand-alone therapy, thereupon limiting their scope. A common combination, SE and cognitive remediation therapy, have yielded positive results for obtaining a job, but not for maintaining it [5, 17]. *Third*, the pre-formulated format of some of these stand-alone therapies can preclude therapists from personalizing

these exercises to participants' subjective (work) experiences. In addition to limiting skills transfer, this can curtail participants' motivation to complete the program [18, 19].

As previously stated, the combination of additional clinical components with SE programs appears to be a promising avenue. We therefore argue that the integration of multiple clinical components, that are adapted to the occupational context and that can be personalized to participants' subjective experiences, could represent a profitable endeavor. Further, we suggest that these additional clinical components be anchored in evidence-based research in order to both optimize existing interventions and capitalize on established mechanisms of actions [(e.g., teaching of problem-solving strategies)20].

For the purpose of developing such a clinical approach, we opted for a comprehensive procedure combining scoping literature review and logic models methodologies. This method has been used to synthesize literature and develop intervention programs based on scientific knowledge [21]. In brief, scoping reviews are exploratory projects aimed at mapping knowledge of complex and heterogeneous literature, which can discern cardinal factors related to a concept [22]. For their part, logic models summarize information in graphical format, thus modeling the links between an intervention's components, anticipated outcomes, and influencing factors (e.g., mediators, moderators)[23]. This method has been deemed flexible and guidelines have been developed by the *W.K. Kellogg Foundation* [24, 25].

The aims of this paper were therefore (1) to conduct a scoping review of predictors and interventions improving job tenure in psychosis, (2) to model the results via logic models methodology, and (3) to describe a new psychosocial intervention developed based on the results of aims 1 and 2.

2. Methods

2.1 Scoping review

The Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines were followed [26] and the study was registered on the Open Science Framework platform (osf.io/he68z). Searches of published sources first took place on September 14, 2018 and were updated on May 1, 2020 and February 14, 2021 using the following databases: Medline, Embase, PsycInfo, and Cochrane Library. There was no restriction regarding the year of publication, but results were limited to studies published in French or English. The following keywords were used for the search: "schiz* OR psychosis OR psychotic*" AND "vocation* OR job*

OR employ*" AND "maintenance OR maintaining OR tenure" AND "intervention* OR treatment* OR therap*" AND "cogniti*". Reference lists of selected articles were screened for identification of additional relevant publications.

Selection of studies was based on the following inclusion criteria: (1) published in a peer-reviewed journal, (2) include participants with a psychosis spectrum disorder or a severe mental health disorder (as defined by the authors), (3) report data relevant to the development of a psychosocial intervention aimed at improving duration of employment (e.g., predictors of job tenure, occupational interventions, links between interventions and outcomes). Given that there is currently no consensual definition of the concept of job tenure, a comprehensive approach was adopted. Examples of job tenure conceptualizations include the number of hours/weeks worked in a specific job or the duration of employment regardless of the number of jobs [4, 27]. Further, we used the definition of "psychosocial interventions" proposed by the *Consolidated Standards of Reporting Trials for Social and Psychological Interventions*, which reads as follow: "Psychosocial interventions for mental health and substance use disorders are interpersonal or informational activities, techniques, or strategies that target biological, behavioral, cognitive, emotional, interpersonal, social, or environmental factors with the aim of improving health functioning and well-being" [28] (p.31). Any type of research design (e.g., pilot studies, randomized controlled trials) or data (e.g., quantitative, qualitative) were considered. Sources that were not published in peer-reviewed journals (e.g., books) were included only if the information presented was not available in another source that met the inclusion criteria. Authors G.S., G.B. and a third person from our lab (Karyne Anselmo, M.Sc.) completed the selection of papers. They performed an initial screening of all identified articles based on titles and abstracts, and then screened full-text articles for inclusion in the final review.

Data from the selected sources were extracted according to a pre-established form. It included bibliographic data (i.e., names of authors, publication year, journal), study details (i.e., study design, sample characteristics, features of the intervention, primary and secondary outcome measures) and key findings related to job maintenance, with particular attention dedicated to the underlying therapeutic mechanisms and contextual factors that might influence job tenure. Data extraction was performed by the same three people who completed article selection and disagreements were resolved by consensus. As recommended for scoping reviews, no risk of bias assessment was performed to optimize mapping of available evidence [22].

2.2 Logic models

Following the literature review portion of this study, the logic models methodology was used to synthesize the results. The logic model was developed following the guidelines described by the W. K. Kellogg Foundation Team [25]. Briefly, a logic model consists of a summary diagram which maps out an intervention and its putative links with anticipated outcomes to develop a summarized theory of how a complex intervention works. A key part of the model is detailing the mechanisms of change, as well as factors that might be influencing outcomes. Accordingly, the objective of the logic model method is not to estimate an effect size, but rather to identify the theoretical basis behind the links between components of an intervention and the expected results [21]. Therefore, combining methodologies of logic models and literature review implies that the extracted data are treated as qualitative in order to inform the development of the model, as described in a recent paper by Winsper, Crawford-Docherty [23]. This flexible method makes it possible to develop evidence-based interventional models, which is in line with one of our objectives. Logic models also have the added value of diagrammatic representation, lending themselves useful for communicating results of literature reviews more clearly and transparently to knowledge users and decision-makers.

3. Results

3.1 Scoping review

A total of 2,957 references were initially retrieved and an additional 134 references were identified through other sources (i.e., reference lists, bibliographies of experts in the field). Of these, 469 papers were further assessed for eligibility. After considering these full-text articles, 94 papers were included in the qualitative synthesis, as depicted in **Figure 1**. The characteristics and main work-related outcomes of each included study is presented in supplementary **Table S1**. Briefly, the majority of studies analyzed data collected in the context of randomized controlled trials (N=28). Others used longitudinal (N=23) or qualitative (N=14) designs and some reported literature review or meta-analytical results (N=15). [Insert Figure 1]

3.1.1 Intervention types

Identified interventions were classified in two categories, namely SE and SE+ programs. In the first category, we included 41 studies using traditional **SE programs** (e.g. vocational support or rehabilitation programs), including the **IPS model**, which uses 8 core principles: rapid job search in the regular labor market, consideration for individual occupational preferences, close collaboration between the clinical team, vocational counsellors and employers,

unlimited support to participants, and social benefits counselling [7]. We also included in this category one study that reported on the ***"WorkingWell"*** smartphone application, which has been developed to provide direct support to participants of IPS programs by tracking progress, setting reminders and taking notes, among other features [29].

The second category comprised 31 studies investigating SE+ programs augmented by interventions addressing cognitive deficits, social skills deficits and/or attitudes and beliefs. The interventions comprising the *first sub-category* specifically targeted cognitive deficits either by **cognitive remediation therapy** [30], **compensatory cognitive training** [31], or **errorless learning** [32]. The majority of studies included in this sub-category investigated SE+ programs augmented with *cognitive remediation therapy* (N=10). The general aim of cognitive remediation therapy is to improve cognitive capacity in participants by providing cognitive strategies and by practicing elementary and complex cognitive exercises [33]. All reviewed studies that included cognitive remediation therapy used a single or a combination of specialized cognitive software programs. Cognitive domains that were trained included attention, memory, psychomotor speed and executive functions. Four studies used or were based on a program called **"Thinking Skills for Work"**, which proposes four core components: 1) cognitive and work history assessment, 2) cognitive remediation training based on the participant's cognitive strengths and weaknesses, 3) implication of a 'cognitive specialist' to the vocational team working in a SE program, to participate in job search planning, and 4) who also provides consultation services related to workplace accommodations [34, 35]. In comparison, one reviewed study augmented SE with *compensatory cognitive training* delivered by an employment specialist, which aims to teach skills and strategies to circumvent cognitive limitations related to attention, memory and executive functions [36]. The IPS program was also augmented with *errorless learning* in two studies, which is a method that aims to teach new skills to individuals with cognitive deficits by breaking down a task in its constituent elements [37, 38]. Steps are hierarchically organized by difficulty level and practiced sequentially to ensure high performance. According to the authors, this method is based on the premise that learning is more durable in the absence of mistakes.

The *second sub-category* of SE+ programs focused on **social cognition and skills training** to improve verbal and non-verbal communication skills, social perception as well as self-assertiveness [39]. The training is described by the authors as a 10-session manualized program using a problem-solving approach to interpersonal conflict aimed at improving social competence [40, 41]. The authors' definition of social competence notably includes the ability to adequately perceive and interpret social cues, anticipate consequences of one's behavior on others, and generate

effective solutions to interpersonal problems [42]. This definition includes elements that appear to be closely related to some of the four core domains of social cognition, namely emotion processing, social perception, theory of mind/mental state attribution (ToM) and attributional style/bias [43].

Interventions included in the *third sub-category* addressed attitudes and beliefs related to work by using techniques based on cognitive behavioral therapy, such as cognitive restructuring and psychoeducation. These included the **Indianapolis Vocational Intervention Program** [44] as well as two adaptations: the **Cognitive Behavioral Therapy for Work** [45] and the **Cognitive-Behavioral Therapy for people registered in SE programs** [9]. The *Indianapolis Vocational Intervention Program* was developed for veterans living with schizophrenia temporarily working in non-competitive work [46]. The program targets work-related self-defeating beliefs, barriers to work, workplace relationships and unrealistic self-appraisal, which includes optimizing personal strengths and weaknesses for work situations [47]. The former adaptation aimed to offer the intervention to individuals with severe mental illness who are seeking competitive employment. It addresses additional themes such as developing a personalized work success management plan [46]. In comparison, the latter adaptation was developed to adjust the intervention to the context of SE programs. It also adds modules on stress management, relaxation exercises, and strategies to manage issues surrounding the disclosure of a psychiatric diagnosis [48]. Another study included in this sub-category augmented vocational rehabilitation with cognitive-behavioral techniques including cognitive restructuring, motivational interviewing, graded exposure and homework [49].

In the *last sub-category*, we included interventions addressing combinations of the aforementioned elements. Two studies combined SE programs with cognitive remediation therapy and work-related social cognition and skills training, which were delivered before the beginning of job search [50, 51]. Another study combined work therapy with individual cognitive remediation therapy and a group intervention targeting **theory of mind deficits** [52]. As one of the four core elements of social cognition [43], the concept of 'theory of mind' is closely related to those of 'insight' and 'mentalization' [53]. It pertains to the abilities to reflect on and infer intentions and beliefs in oneself and others [54]. The authors report that this combined program took place prior to the enrollment of participants in a SE program. Work therapy constituted of 10 modules notably addressing motivation, assistance for writing and submitting one's curriculum vitae, and developing strategies for job interview and work-related difficulties. One study combined the 'Indianapolis Vocational Intervention Program' with cognitive remediation therapy [55]. Two other studies reported

on combining SE programs with an intervention entitled "**Workplace Fundamentals**", which aims at developing skills for succeeding in the workplace, such as managing psychiatric symptoms, medication and physical health, identifying workplace stressors, maintaining motivation and developing strategies to resolve interpersonal issues [56, 57]. Finally, one study described the **PASS** program, which addresses various factors related to placement (e.g., stress level, interest-job fit, work accommodations, stigma), attitude (e.g., flexibility, willingness, openness), support (e.g., friends, family, professionals, community organisms), and skills (e.g., technical, interpersonal, self-care, life management) [58].

Throughout our literature review, we identified several other intervention programs, but because their effects on job tenure predictors were not directly tested, or because they focused on other components of occupational functioning (e.g., interview skills), they were not included [59-62].

Putative mechanisms of action

Observational or experimental studies of a qualitative or quantitative nature included in our review described mechanisms of action used by interventions to reach desired outcomes. Mechanisms of action represent process variables, as opposed to therapeutic targets, that are believed to enable interventions to specifically address predictors of job tenure and therefore lead to desired outcomes [28]. These reviewed mechanisms of actions were divided into four categories. The *first* category includes those that foster **connection**, such as developing a positive therapeutic alliance [63], using a group setting [64, 65], as well as offering frequent contacts with the clinical/employment counselling team [66, 67]. *Second*, the results of our literature review indicated that another way for interventions to address job tenure predictors is by cultivating **engagement** of participants in their occupational process via exercises that are rapidly perceived as being useful and by developing attractive interventional material [68]. *Third*, identified putative mechanisms of action also included variables related to the **teaching** of strategies, such as problem-solving and cognitive strategies, emotional coping skills and the promotion of mental health literacy for patients and other stakeholders [69, 70]. The *fourth* category of variables included **transposition** mechanisms that allow participants to transfer their knowledge to real-world situations [71], to conceptualize work as part of their recovery process [72, 73], and to benefit from additional support related to non-vocational aspects of their functioning [74].

Predictors of job tenure

The predictors of job tenure identified in observational and experimental studies of our literature review were divided according to the classification used by Corbière, Charette-Dussault [75], which includes individual and environmental predictors. The former category was further divided into 4 sub-categories. First, **individual predictors** *related to the self*, like self-esteem [76-78], self-efficacy [79], and personality traits [80] have been identified as predictive of employment duration. The individual's attitudes (e.g., flexibility and open-mindedness [58, 81]), job skills [82], as well as the fit between the person and the job [73, 83] have also been included in this section of job tenure predictors. Second, reviewed individual predictors *related to motivation* included levels of intrinsic motivation [84] and motivation to keep working [85]. The third sub-category of individual predictors *related to the psychiatric condition* were further subdivided into psychiatric symptoms and cognitive deficits. In the former, variables like the degree of management of psychiatric symptoms [82], the severity of negative symptoms ([e.g., anhedonia, asociality; 86]), social and communication skills [77], as well as the level of social functioning [87], were identified as predicting job tenure in psychosis. In the latter, individual predictors *related to cognitive deficits*, the following domains were identified as most predictive of employment duration: memory [14, 88-91], attention [92, 93], executive functions [94-96] and decline in intellectual quotient since symptom onset [97].

The second category included predictors of job tenure associated with the **work environment**. They were mainly related to relationships with colleagues and supervisors, in terms of their attitude [76] and the support they provide [12, 15] for tasks [98] and accommodations [99]. The realistic possibility of disclosing one's psychiatric diagnosis was also identified in our literature review as a predictor of job tenure in psychosis [76, 100]. Further, evolving in a respectful work culture as well as being employed and supervised by people who hold realistic expectations were also identified as predictors of job tenure [73, 101].

Contextual factors influencing outcomes

Some variables identified through our literature search did not specifically predict employment duration, but were believed to influence desired outcomes (i.e., improved job tenure and/or reduced job termination). One was labelled as a **positive contextual factor**, such as having social support from friends and family [12, 72, 77], because it positively impacts employment duration. Another was classified as a **negative contextual factor**, such as having family issues [13], because it tends to have a reducing effect on job tenure or expedite work termination.

3.2 Logic model

The logic model presented in **Figure 2** was systematically developed by organizing and synthesizing the information extracted from the literature review described above. Following an iterative procedure, the final logic model represents consensus by all authors. The model describes how *intervention types* use *mechanisms of actions* to target *predictors of job tenure* resulting in *desired outcomes*, which are influenced by *contextual factors*. ~~Sections of the model are described below~~. To complement the information reported in the logic model, supplementary **Table S2 and S3** present how each intervention type uses or targets the mechanisms of action and predictors of job tenure proposed in our model. [Insert Figure 2]

3.3 Description of the *Minds@Work* program (M@W)

Based on the findings identified from the literature review and synthesized in the logic model, a new intervention – called Minds@Work – was developed. As previously stated, augmented and integrative approaches appear to be most promising for improving the job tenure of people diagnosed with a psychotic disorder. Therefore, M@W was designed to include the identified putative mechanisms of action and target the predictors of job tenure, as much as possible. The full program and material are available in French and English, and can be obtained upon request. A description of the modules and setting of the program follows.

Modules

The M@W program is divided into 9 modules of equal duration covered over the same number of sessions, as presented in **Table 1**. In line with the predictors of job tenure identified in the proposed logic model, modules 1 to 6 focus on the self, while modules 7 and 8 concentrate on others in the work environment (e.g., colleagues, supervisors). The ordering of the modules has been carefully planned so that each one lays the foundation for the next. Given the qualitative focus of the literature review portion of this study, equal weight has been allocated to each module in order to be both concise and broad-spectrum at the same time [102-105]. As discussed in the next section, more studies are needed to optimize the design of psychological manualized programs.

Theoretical bases for the development of the modules include: positive psychology, mindfulness and self-determination theory [(modules 1 & 2); 106, 107]; neurosciences and cognitive training [(modules 3 & 4); 108]; cognitive biases and theory of mind [(modules 5 & 7); 109]; social cognition and social skills, mentalization, and emotional processing [(modules 6 & 8); 53, 110, 111, 112]. Further, development of the exercises comprised in the

M@W program was inspired by the following evidence-based interventions: cognitive remediation therapy [113]; compensatory cognitive training [114]; metacognitive training [115]; social cognition and interaction training [112]; dialectical behavior therapy [116]; mentalization-based therapy [53]; emotional regulation therapy [111]; and the MIRRORS intervention [117], which has adapted the principles of mindfulness-based cognitive therapy [118] and mindfulness-based stress reduction therapy [106]; as well as 'cognitive-behavioral therapy for SE programs' [119] and 'cognitive-behavioral therapy for work' [45], both of which were adapted from the Indianapolis Vocational Intervention Program [120]. [Insert Table 1]

For all modules, psychoeducation and strategy-based remediation approaches have been used. In accordance with our logic model's identified mechanisms of action, the sessions are designed to take place in a group setting, be very interactive and filled with discussions and exercises. Further, participants are invited to develop a work-related personal objective at the beginning of the program, which will then be discussed biweekly to assess progress and deal with barriers. In line with the 'cognitive-behavioral therapy' framework, participants are invited to complete weekly personalized homework (referred to as 'challenges' in the program) wherein they practice the personalized strategies that have been developed during the session. These elements of the program are put in place to maximize participants' motivation and interest. To optimize knowledge transfer opportunities, the vast majority of proposed exercises are directly built from participants' subjective work experiences. Further, it was important to develop interventional material that is both stigma-free and accessible to individuals with different levels of reading and writing skills.

Setting

The M@W program is designed for people currently employed and it is ideal for the intervention to be delivered onsite or online for several reasons. First, it facilitates transportation for participants who would otherwise have to commute from work to where the sessions are taking place. Second, if and when possible, sessions can be delivered during working hours to reduce the possible psychological strain of having to work and additionally attend weekly interventional sessions. Third, if the participants are comfortable disclosing their psychiatric diagnosis, the program is designed to foster collaboration with staff members and participants' immediate supervisors, thus aiming to optimize knowledge transfer and to develop mental health literacy. Hence, it is recommended in the M@W program to involve a staff member (e.g., onsite psychosocial worker, counsellor) to act as group co-facilitator, and to provide immediate supervisors with a presentation of the program's themes and strategies. The objective behind this is to

better equip them for the endeavor that they are invited to undertake, namely encouraging and coaching participants to use their strategies at work when they are facing difficulties.

Despite its initial design, the M@W program can be easily adapted for other contexts. For instance, it could be used as a stand-alone intervention or integrated in SE/SE+ initiatives. Therefore, individuals who are not currently working could still benefit from the intervention as a preparation step for a future job. All of the M@W material can be readily used by employment specialists or healthcare workers and include detailed manuals for participants and group facilitators, Microsoft PowerPoint® presentations, exercise sheets, and handouts for participants and immediate supervisors.

4. Discussion

The present study's objective was to systematically review the literature on job tenure in people diagnosed with a psychotic disorder in order to develop a logic model illustrating the putative links between interventions, processes and outcomes. This subsequently informed the development of a new group psychosocial intervention, called Minds@Work, that specifically aims to improve job tenure in psychosis.

Throughout our literature search, we identified 94 relevant studies from which the findings were qualitatively interpreted and mapped out in our proposed logic model. Two main intervention typologies were identified, namely (1) SE and (2) SE+ augmented with additional interventions addressing cognitive and/or social skills deficits, dysfunctional attitudes and/or beliefs, or a combination thereof. The identified processes included putative mechanisms of action (i.e., connecting, engaging, teaching, transposing) and predictors of job tenure (i.e., related to the individual and to the work environment). This, in turn, is believed to result in desired outcomes, namely improved job tenure or reduced job termination, which can be influenced by contextual factors (e.g., family issues, positive social support). Our findings allowed us to develop a novel intervention which capitalizes on using putative mechanisms of action to address variables most predictive of improved job tenure in psychosis.

4.1 Theoretical implications

First, our proposed logic model provides researchers and clinicians with a more comprehensive understanding of how SE and SE+ programs reach their objectives of improving job maintenance for individuals diagnosed with a severe mental health disorder. Other recent literature reviews have already identified factors

impacting job tenure and the present study complements their findings. Specifically, some of these studies have reviewed the factors that impact both job acquisition and tenure without distinguishing between the two concepts [72, 121-123] . While representing an important initial effort, Corbière, Charette-Dussault [121] and Johannesen, McGrew [124] invite researchers to conduct separate analyses because the nature and prominence of influencing factors may vary longitudinally across the career development process of individuals diagnosed with a severe mental health disorder, thus influencing the structure and aim of interventions. The present study therefore offers a first step in this direction and builds on the review work of Williams, Fossey [125], which listed factors specifically impacting job tenure in severe mental illness. In their paper reviewing 19 studies, the authors suggest that stakeholders can use their identified factors to guide intervention. Through the delineation of putative mechanisms of action, our study supplements their findings by offering insights into *how* stakeholders can effectively integrate this knowledge into their practice.

Another theoretical implication relates to the methodology used in our study, namely, combining literature review and logic model methodologies to inform the development of a psychosocial intervention. When aiming to create a new therapeutic program, researchers in psychosocial fields have few guidelines at their disposal. Prevailing approaches, like the *Medical Research Council Framework* [126] or *Intervention Mapping* [127], mostly come from medical disciplines and can be arduous to implement because they aim to develop very sophisticated interventions involving several stakeholders at different organizational and political levels. Therefore, the present study, along with others [21, 23, 128], demonstrates how results of literature reviews can be schematically presented and how smaller-scale psychosocial interventions can be developed and systematically informed by scientific evidence.

4.2 Clinical implications

One major strength of this study that bears important clinical implication is the development of a readily usable and accessible manualized intervention that psychosocial workers and counsellors can use with their clientele. By involving different organizational stakeholders (e.g., immediate supervisors), by capitalizing on putative mechanisms of action, and by simultaneously addressing several domains predictive of improved job tenure, our intervention aims at overcoming some of the recognized limitations in the field, such as modest knowledge/skills transfer to occupational settings and restricted scope of intervention [5, 16, 18, 20].

Other clinical implications of the current work relate to the multidimensional benefits of improving occupational functioning of people diagnosed with a severe mental disorder. Over the years, it has been repeatedly demonstrated that work participation and recovery beneficially impact one another [129, 130]. More specifically, at a clinical level, studies have shown that having a job significantly improves psychotic and depressive symptoms, cognitive and emotional health, and quality of life [131-135]. In addition to these individual benefits, more inclusive work participation of people diagnosed with a severe mental disorder can also have positive economic impacts for society by reducing healthcare costs [136]. Therefore, our proposed logic model also has the advantage of informing researchers, clinicians and decision-makers about putative underlying mechanisms of action that could be used to optimize existing programs so as to further mitigate the economic burden of mental illness on public healthcare systems.

4.3 Limitations

This study presents several limitations. To begin with, the large scope of our literature review search raises the possibility that not all relevant published studies were identified. Further, our proposed logic model was informed only by the scientific literature and did not include perspectives of multiple sources of stakeholders, as suggested in the guidelines of the W. K. Kellogg Foundation Team [25]. However, these guidelines have been developed specifically for program development, management, and evaluation. Therefore, their recommendations more specifically target local endeavors that are planned to be implemented onsite and so, coherently encourage involving people working at different levels of the organization. Our aim being slightly different (i.e., developing an accessible intervention that could be implemented in different sites and contexts), we followed the guidelines' steps that were most applicable to our objectives.

Another important limitation is that the acceptability, feasibility and efficacy of our proposed intervention has not yet been validated as part of a behavioral therapeutic trial. To that effect, pilot testing with local social enterprises is ongoing and the readiness of use of the M@W program should facilitate larger scale validation in future studies. Validation steps could follow the ORBIT model [137], a framework developed for designing and validating behavioral treatments, wherein authors suggest to first define the basic elements of a new intervention through review of the literature for example. Later steps include proof-of-concept and pilot studies using quasi-experimental designs before embarking on efficacy trials and effectiveness studies. Further, the possible drawbacks surrounding the

disclosure of one's psychiatric diagnosis should be carefully considered in such cases whenever other stakeholders are involved, as it is suggested in the present program [76].

Also, our proposed logic model does not distinguish between stages of illness [i.e., clinical high-risk, first-episode, multiple episodes; 138]. Because of previous studies showing the efficacy of supported employment programs in first-episode psychosis [139], we decided not to restrict our literature search to specific stages of psychosis. It will be interesting in future investigations to verify if our proposed logic model represents an adequate portrayal of how supported employment interventions facilitate job tenure at different stages of illness. Finally, the M@W program's duration has been equally divided for each component, which might not be optimal since it could be argued that more time should be spent on some specific modules. More studies are needed to better understand the specific effects of different treatment components for more effective designs. A more refined understanding of the weight of each predictors of job tenure will also inform future endeavors in how best to modularize interventions' components.

4.4 Conclusions and future directions

The current study aimed at reviewing the literature on job tenure in psychosis and to map out the findings using logic model methodology, in order to ultimately develop a scientifically informed intervention to improve duration of employment in people diagnosed with psychotic spectrum disorders. Our proposed model notably highlights the putative mechanisms of action that allow existing SE interventions to promote occupational functioning in severe mental illness. Important future directions include the enhancement of mental health literacy in employers, immediate supervisors, union representatives, insurers, and other workplace stakeholders to facilitate the hiring and maintenance at work processes of individuals diagnosed with severe mental disorders.

Declarations

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Figure legends

Fig. 1 PRISMA flow diagram of study selection, inclusion and exclusion, N = number of studies

Fig. 2 Proposed logic model illustrating putative links between intervention typologies, processes and outcomes

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