Research Article

A Nonrandomized Controlled Trial of Strengths Model Case Management in Hong Kong

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Abstract
Purpose: This study evaluates the effectiveness of the strengths model of case management (SMCM) for people with severe mental illness in Hong Kong. This is the first controlled trial outside the United States to investigate the impacts of SMCM on caseworkers as well as service users alongside fidelity measures. **Method:** Service users and their caseworkers were recruited from three types of supported accommodation for this 12-month nonrandomized controlled trial. Mixed modeling was used to investigate within-subject differences. **Results:** Results indicated that SMCM was effective in helping users progress toward their recovery goals and in alleviating emotional exhaustion among caseworkers. However, it was ineffective in improving, hope, well-being, work alliance, and psychiatric symptoms. High intervention fidelity was associated with positive outcomes. **Conclusions:** Conceptually, SMCM has the potential to improve service users' functional but not personal recovery. It is also potentially conducive to the well-being of caseworkers.

Keywords
recovery, strengths perspective, goals, treatment fidelity, psychosis, Asia

Initially utilized by people with a lived experience of mental illness in the psychiatric survivors' movement, the concept of recovery and subsequent recovery-oriented practice in the mental health system now appears in the policies of several countries (Khoury & Rodriguez del Barrio, 2015). Recovery is defined as "a deeply personal, unique process of changing one's attitudes, values, feelings, goals, skills, and/or roles. It is a way of living a satisfying, hopeful, and contributing life even with limitations caused by illness" (Anthony, 1993, p. 15). This personal recovery perspective expands the concept of clinical recovery, which only sees recovery in terms of symptom reduction, and is highly consistent with the core values of social work, which puts clients' self-determination, empowerment, and self-worth at the heart of its practice (Carpenter, 2002).

Firmly in line with the discourse of recovery, strengths-based approaches to case management for people experiencing mental illness have become increasingly prominent and welcomed by mental health practitioners and clients over the past few decades (Saleebey, 1996; Tse et al., 2016). Developed by The University of Kansas (KU) in the 1980s as an alternative to a preoccupation with individual deficits and pathologies in the existing mental health service system, the strengths model of case management (hereafter SMCM) has focused on identifying individual and environmental strengths and resources so as to facilitate the integration of people experiencing mental illness into a community and to help them live a meaningful life

beyond mere survival (Charles & Sullivan, 2014; Weick, Rapp, Sullivan, & Kisthardt, 1989).

SMCM builds on six principles (Rapp & Goscha, 2012): (a) people with psychiatric disabilities can learn, grow, and change; (b) the focus is on an individual's strengths rather than deficits; (c) the community is viewed as an oasis of resources; (d) the client is the director of the helping process; (e) the worker–client relationship is essential; and (f) the primary setting is the community. Embracing these principles, SMCM-oriented workers are creative in helping clients achieve a life worth living that has meaning, purpose, and a positive sense of identity. SMCM does not ignore the problems and barriers that clients face in their lives. However, such problems and barriers

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are always viewed within the context of important goals that they want to achieve. SMCM requires transformations in our systems of care (e.g., in caseload and supervision structures) to best support clients in finding niches within their communities in which they can thrive. A critical review has identified SMCM as the model that has the most widely used assessment methods (the strengths assessment worksheet), and as the only model that has a validated fidelity measure to monitor the integrity of an intervention (Tse et al., 2016). SMCM is now being practiced in the United States and Canada and is steadily extending outside North America. To date, mental health professionals in both Japan and Hong Kong have received training delivered by the original strengths model team. In preparation for delivering the intervention and conducting this study, in April 2012, over 100 mental health social workers from three local nongovernmental organizations (NGOs) and their supervisors attended 4-day training workshops in Hong Kong conducted by Goscha (the founding author) and colleagues.

To date, there have been seven studies conducted in Western countries and one in Hong Kong examining the effectiveness of strengths-based interventions (Hui et al., 2015; Tse et al., 2016). Most studies have found strengths-based interventions to be effective in improving some outcomes such as employment and reported improved physical and mental health. For example, there has been a reduction in the duration of stay in hospital among service users who received case management under the strengths model (Björkman, Hansson, & Sandlund, 2002; Blow et al., 2000; Fukui et al., 2012) and their satisfaction with service also increased (Björkman et al., 2002); service users also have improved psychological well-being such as self-esteem, self-efficacy, personal confidence, sense of hope, and life satisfaction (Barry, Zeber, Blow, & Valenstein, 2003; Fukui et al., 2010; Green, Janoff, Yarborough, & Paulson, 2013; Hui et al., 2015); and these improvements could also enhance their employability and educational attainments (Green et al., 2013). However, the evidence is inconclusive because most of these study designs were moderate or poor, for example, the Hui and associates' study used a single group, pre- and posttreatment design, and without fidelity tracking (Ibrahim, Michail, & Callaghan, 2014; Tse et al., 2016) and they failed to differentiate the confounding variables of the strength-based approach.

Study Overview

This study was designed to investigate the effectiveness of SMCM on recovery, psychosocial functioning, psychiatric symptoms, and goal achievements for clients and to understand the work-related outcomes of SMCM for social work professionals (referred to here as caseworkers to align with the terminology used in Kansas). To increase the potential representativeness of the findings, participants were sampled from three types of supported accommodation: long stay care homes, halfway houses, and supported hostels. Long stay care homes cater for those in need of nursing care, usually older adults, halfway houses offer training and rehabilitation for

those whose ultimate goal is reintegration into society, and supported hostels are for those in need of minimal care and who are able to live semi-independently.

To monitor the adherence to the protocol of SMCM, as well as for research purposes, treatment fidelity was also assessed, twice before the commencement of the trial and once during the trial. Using this data, we examined the association of intervention fidelity with outcomes. Finally, the protocol for this trial was previously published in *BMJ Open* (Tsoi, Tse, Fukui, & Jones, 2015). This trial is registered at the Australian New Zealand Clinical Trial Registry, number 12613001120763, and the reporting of this trial adheres to the Transparent Reporting of Evaluations with Nonrandomized Designs guidelines.

Contributions of Authors

This study was conceived by lead authors S.T. and E.T. who also developed the theoretical basis and research methodology. E.T. and C.H.Y. completed the data analyses and E.T. produced the first draft of this article. Coauthors S.K.C., S.W., and E.W. assisted in the implementation and planning of the trial, and L.L. provided assistance in the final write-up of this article. Every author approved the final version of the present report.

Justifications for Adopting a Nonrandomized Design

This was a developmental study using a nonrandomized design. We chose this design because SMCM is not only a complex intervention (Craig et al., 2008) but also a novel practice in Hong Kong. By adopting a pragmatic design, this study's feasibility, such as the retention rates of participants and the effectiveness of measurements in detecting changes, could be documented to inform more rigorous trials in the future. In addition, the treatment fidelity of SMCM is established on the basis of service units (e.g., community team and supported accommodation), not individual practitioners who require extensive resources; thus, we could not conduct a large-scale study using block randomization.

Method

This was a 12-month controlled trial comparing the effects of treatment on individuals in the intervention group with the effects of treatment-as-usual (TAU) on individuals in the control group. Pretreatment data collection occurred before commencement of the intervention, then again at the 4th and 11th months for within-subject comparison.

Site Selection and Participant Recruitment

First, we selected accommodations operated by three different NGOs as study sites. The selection of these three NGOs and the sites was based on a history of long-term collaboration between the author S.T. and the agency supervisors (S.K.C., S.W., and E.W.). Within the three participating NGOs, a total of six sites

(two of each type of residential facility described above) were selected to be participating sites. A site was either a single ward of a larger residence or the whole residence. There were a total of eight sites from these three NGOs. The three intervention sites were selected because the practitioners had received training in SMCM at those sites. Then, three sites of the remaining five were selected—those without any prior exposure to SMCM and with matching characteristics (size of the sites; age, gender, and diagnoses of the residents) were invited to become the control sites. Everyone from those six sites (including clients and caseworkers) was recruited on a voluntary basis, after screening for eligibility. Clients were approached by their caseworkers and were eligible to participate if they were diagnosed as having schizophrenia or bipolar disorder and were able to read and comprehend Chinese. A similar recruitment procedure was adopted at the control sites.

For caseworkers, we invited all of the colleagues who had undergone the SMCM training and would deliver SMCM at their intervention sites during the trial period to participate. After obtaining the demographics of the caseworker participants from the intervention sites, the information was passed anonymously to the matching control sites. Following that, the center-in-charge from each control site mentioned the trial to the caseworkers with matching characteristics (i.e., gender, age, and years of clinical experience). Our research assistants formally recruited the potential participants. All of the participants (service users and caseworkers) were briefed about the study and their written consent was sought. Since the service teams in the intervention and control sites were independent of each other (e.g., workers had separate training and clinical supervision), minimum across-site contamination was anticipated.

Sample Size Consideration

Due to constraints in resources, only six sites could be used as intervention and control sites. All of the residents from these six sites were invited to participate after screening for eligibility.

Intervention and Control Conditions

All caseworkers that delivered the intervention had received training in SMCM. This included a 2-day training course on implementing SMCM from Goscha and colleagues from KU; caseworkers also attended bimonthly group supervision sessions with Goscha via Skype. The SMCM group used three major tools to support the delivery of interventions (for details, see Rapp & Goscha, 2012). First, caseworkers engaged in continuous biweekly strengths-based group supervision at the supported accommodation. Two additional tools used to guide the intervention sessions were the strengths assessment and the personal recovery plan, both developed by the KU team. The intervention consisted of regular individual sessions (approximately once every 2–3 weeks), each lasting for 30–60 min, preferably taking place in the community, such as at nearby parks and fast food locations (SMCM principle six). The goals of each intervention session were to uncover the strengths of the individual by using the strengths assessment, to assist the individual in setting their recovery agenda, and to match their strengths to achieving those goals through the personal recovery plan. Over the course of the intervention, practitioners also modified individual needs on a regular basis, adjusting for changing personal, financial, or social circumstances. The SMCM intervention ran for the entire course of 12 months. Fidelity monitoring included chart reviews of treatment plans, strengths assessments, personal recovery plan, and progress notes by two reviewers (S.T. and a person with lived experience of mental illness). Supervisors, caseworkers, and service users were randomly selected for a brief face-to-face interview on the day of the fidelity visit. One on-site observation of strengths-based group supervision was also conducted in each location during the trial period. After the visits, the reviewers were required to complete the rating scale, compare scores, and resolve any disagreements. The final fidelity report and scores were submitted to and moderated by Goscha. The scores improved over time. The last fidelity assessment before the trial indicated that all intervention sites had an average score of 2.6/5. During the course of the intervention, this average score rose to 3.7/5. The improvements in scores fell into several domains including supervisor's duties, integration of strengths assessment, and putting the personal recovery plan into practice.

Those in the control group received TAU that typically consisted of general individual casework, community outings, or psychoeducational groups (clients in the intervention group might attend similar activities). The caseworkers in the control group did not attend any strengths-based group supervision and did not use the tools of the strengths assessment or the personal recovery plan.

Data Collection

Four people with lived experience of mental illness were employed as part-time research assistants for the data collection work. They were all women and they all had attained at least a secondary education level; the latter criterion was considered important as they would need to understand written documents as well as the content of questionnaires. All the interviewers participated in a 3-hr training workshop that included a briefing of the research; ensuring interviewers understood the questionnaires to be used in the study; reviewing research ethics, such as the proper way of handling sensitive interview data, the proper way of storing questionnaires, and the importance of confidentiality; and discussing practical guidelines on how to build rapport and engage participants. Some pointers for handling emergencies or unanticipated incidents were also discussed. Study participants' membership in the intervention or control group was not disclosed in order to ensure the assessors were blind. Throughout the study, the first author provided regular support and coaching to the research

assistants to ensure consistency and accuracy in questionnaire administration.

All data collection took place at the participants' accommodation, usually in the evening for those with part-time or full-time job engagements, or during the day for those who were not working or who were retired at the time.

Outcome Measures

Primary Measure

Recovery. To measure recovery, the Maryland Assessment of Recovery in People with Serious Mental Illness (MARS; Drapalski et al., 2012) was used. The measurement contains 25 items on a 5-point Likert-type scale (1 = *strongly disagree*; 5 = *strongly agree*) measuring the domains of recovery as proposed by the Substance Abuse and Mental Health Services Administration. These domains are self-direction or empowerment, holistic, nonlinear, strengths-based, and responsibility and hope. A higher score indicates a higher level of recovery. The scale has excellent internal consistency (Cronbach's α = .95) and test–retest reliability (r = .89), as well as good content and face validity (Drapalski et al., 2012). There is also recent evidence for the construct validities of the scale concerning self-stigma (r = −.29), self-esteem (r = .39), and subjective quality of life (r = .63; Chan, 2012). In this study, we used a Chinese version translated and validated by Chan (2012).

Secondary Outcome Measures

Satisfaction with life. Subjective well-being, or satisfaction with life, was measured using the Satisfaction with Life Scale (SWLS; Diener et al., 1985). The SWLS has been heavily used in healthy, diseased, and psychopathological populations for decades, both in the West and locally (Cheng & Chan, 2006; Diener, Diener, & Diener, 1995). The SWLS has 5 items in total on a 4-point Likert-type agreement scale. Total scores are calculated to indicate the overall satisfaction and fulfillment of a person's life (Diener, Oishi, & Lucas, 2009), with a higher score indicating a higher level of life satisfaction. Psychometric properties of the scale were demonstrated to be good, with Cronbach's αs above .80 across studies (Pavot & Diener, 1993). The scale also correlated negatively with mental illness-related constructs such as psychiatric symptoms and future suicide attempts and showed good convergent validity with other scales measuring global life satisfaction. The SWLS has been translated into Chinese and validated (Cheng & Chan, 2006).

States of hope. States of hope were measured with the State Hope (SH) Scale (Snyder et al., 1996). It is a popular instrument that measures an individual's current feelings of hope (in contrast with dispositional hope), with a higher score indicating a higher sense of hope. This scale was chosen primarily because of its sensitivity in picking up changes in the level of hope over time. In this study, we adopted a Chinese version of the SH Scale that was previously used in other mental health

projects. This Chinese *version was formally published as a validated scale.*

Psychiatric symptoms. Psychiatric symptoms were measured with the Brief Psychiatric Rating Scale (Overall & Gorham, 1962), which was found by a meta-analysis to be the most commonly used treatment outcome measure for clinicians (Burlingame et al., 2005). It evaluates respondents with 18 symptom constructs, which are commonly presented across a wide range of mental disorders. In this scale, a higher score indicates more psychiatric symptoms being present. Mounting evidence reveals that this rating scale has excellent reliability and validity, with Cronbach's αs averaging over .85 (Burlingame et al., 2006). The scale also demonstrated good sensitivity to measuring changes in the severity of symptoms (Burlingame et al., 2006). In this study, the English version was used and filled out by the caseworkers.

Therapeutic alliance. The Working Alliance Inventory (WAI; Horvath & Greenberg, 1989) was used to measure three components of therapeutic alliance: the bond between the therapist and the client, the agreement on goals, and the agreement on tasks. The WAI demonstrated good psychometric properties, with test–retest reliability ranging from r = .85 to r = .93, and an α value higher than .85 (Horvath & Greenberg, 1989). In this study, we used the short form of the WAI, which contains 12 items on a 7-point Likert-type scale (1 = *never*; 7 = *always*), with a higher score indicating a higher level of therapeutic alliance. Since no valid Chinese version of the WAI was available, it was translated according to the guidelines proposed by Guillemin, Bombardier, and Beaton (1993).

Goal achievements. The identification of strengths and using strengths to achieve recovery goals is crucial in the intervention, and through achieving goals, clients gain a sense of control, self-confidence, and self-efficacy, thus facilitating their recovery (Corrigan et al., 2012; Shanks et al., 2013). Hence, a section was designed to gauge the progress of the achievement of goals. The first two questions were about clients' perceptions of their own ability to achieve the recovery goals they had set for themselves and about their level of confidence. These two questions, even though seemingly rudimentary, are in fact essential for predicting goal outcomes (Zimmerman, Bandura, & Martinez-Pons, 1992). Following these two questions, clients were asked to rate the progress of the goals they had set on a scale of 1–5, where 1 denotes *no progress* and 5 denotes *goal achieved*.

Others. Other outcomes, such as vocational outcomes or occurrence of hospitalization, were tracked by the caseworkers. For vocational outcomes, there were six employment categories: unemployed, day training, activity center, workshop, supported employment, and open employment. These were coded on a numerical scale (ranging from 1 to 6, where a higher number denotes a more competitive outcome).

Outcome for Caseworkers

Burnout. Burnout is defined as both an exhaustion and a diminishing sense of interest in work resulting from excessive demands on energy and resources. The Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1986) is the most widely used measure of burnout and has previously been used in mental health services research (Prosser et al., 1999). Burnout among professionals can significantly affect the quality of services they deliver, and outcomes involving mental health professionals should also be included in service model evaluations (Lloyd & King, 2004; Maslach & Leiter, 2008). The Burnout Scale contains 18 items on a 5-point Likert-type scale to measure three subscales of burnout: (a) emotional exhaustion, defined as a lack of emotional resources, so that caseworkers feel like that they are not able to continue working, (b) depersonalization, defined as negative feelings or attitudes toward users, and (c) reduced personal accomplishment, defined as having feelings of worthlessness or holding negative views of oneself concerning work with users. In our analysis, we recoded the reverse scoring items, such that a higher score signifies a lower level of burnout. Maslach and colleagues set a threshold for each subscale, and burnout is thought to occur when that threshold is reached. The threshold for emotional exhaustion is set at 521, for depersonalization at 58, and for personal accomplishment at 428. In this study, the Chinese version was adopted (Ngai, 1986). The scale has demonstrated adequate internal consistencies (test–retest: $r = .80$ to .88) and good factor structure of the three factors of the scale (Yuen, Lau, Shek, & Lam, 2002).

Perceived supervisory support. The amount of supervisory support and the benefits and results related to supervisory support were assessed by the Perceptions of Supervisory Support Scale (Fukui, Rapp, Goscha, Marty, & Ezell, 2013). Factor analysis confirmed the three factors: emotional support, support for users' achievement of goals, and support for educational or professional development. A higher score signifies a higher level of perceived support from supervisors. It was demonstrated that this scale has good content validity and good internal consistency (Cronbach's αs were .9, .9, and .7). A Chinese version was not available; hence, the same translations procedures as for the WAI were used.

Study Hypotheses

In this study, four sets of hypotheses were tested as follows:

1. The outcomes for users (subjective well-being, hope, psychiatric symptoms, work alliance, and goal achievements) from the intervention group would show better results at the 12th month of the study.
2. The individual's type of residence and group membership (in either the intervention or control groups) would have interaction effects on the outcomes; that is, changes over time would be dependent upon the type of residence the client resides in.
3. Sites with a good overall fidelity rating would show better overall results compared to the control site of the same residential type.
4. The outcomes for caseworkers (burnout and perceived supervisory support) from the intervention group would show better results at the 12th month of the study.

Data Analysis

JMP®Pro 12 was used to conduct statistical analyses using t tests and χ^2 tests for baseline differences and mixed modeling for intervention effects. The mixed modeling approach is considered to be more appropriate in this study than repeated measures like analysis of variance (ANOVA) because multistage sampling was used. Each participant was nested within a service unit, and each service unit was nested within a type of residential setting, which presumably differed in management and operation styles; therefore, there was an assumed correlation between responses from individuals from the same group.

The primary analysis of this study involved comparing the differences between groups, and secondary analysis involved testing whether the group differences (if any) were dependent upon the type of residence (i.e., whether there was any interaction effect). As such, residential type and group membership were set as fixed effects of the model. Then, each individual difference was tested with a repeated measures setting within the mixed model personality in JMPPro. Time effects were examined visually using least square (LS) means plots where necessary. For the staff data, due to the small sample size ($n = 43$), ANOVA with repeated measures was used in detecting mean differences over time. Finally, using descriptive statistics, we identified the service unit with the highest fidelity setting and compared the mean differences over time against their counterparts from the control group using data visualization techniques (LS means plots). Mixed model approaches handle missing data with maximum likelihood estimation. For the effect sizes of the main effects, raw means were used to calculate Cohen's d. We adopted the widely used suggestions as to what constitutes small, medium, or large effect sizes by Cohen (1988) and Baguley (2009) in interpreting Cohen's d values. When the d value is equal to or smaller than .20, it is considered that the size of the mean difference between the two groups in one outcome variable is small; when the d value is greater than .20 and less than .50, the magnitude of the effect is medium; any value that is greater than .80 is considered to be large or very large. For effect sizes of the interaction effects, η^2 values were calculated. η^2 values are typically used to measure the overall effect of an ANOVA and they are more easily interpreted when specific comparisons (in our study, the mean differences) are needed. As a rule of thumb, an η^2 of .02 or smaller is considered small, an η^2 between .02 and .13 is considered medium, and an η^2 between .13 and .26 is considered large (Richardson, 2011). η^2 is analogous to R^2 from the

regression model, in which the number represents the proportion of variance accounted for by the interaction effect.

Protocol Deviations

Between the 9th and 10th month of the trial, there was a flu outbreak at some of the sites. Visitations were restricted for an extended period of time. Therefore, it was decided that the trial was to be extended, and the last wave of data collection took place in the 12th month. In addition, the Organizational Climate subscale was removed as an outcome measure after the pilot test for both the service users and the caseworkers, in order to restrict the length of the trial assessments. This research article reports only part of the data from the larger study described in the published protocol; the data for the process evaluation and qualitative investigation are not included in this article. Overall, these deviations neither affected the quality of the data nor impacted the participants' well-being or safety.

Ethical Clearance

This research received ethical approval from the Human Research Ethics Committee for Non-Clinical Faculties of The University of Hong Kong (HRECNCF, EA140913).

Results

Participant Characteristics

Of all, the users who participated ($n = 147$), 64 were female (43.5%), and over 85% had been diagnosed as having schizophrenia. Forty-three caseworkers participated. At the end of the study, 59 of the 73 users remained in the intervention group and 65 of the 74 users remained in the control group. With regard to the caseworkers, 22 of the 23 remained in the intervention group and 18 of the 20 remained in the control group. Overall, 124 users and 40 caseworkers remained at the end of the study, marking an attrition rate of 15.7% and 7.5% for each group, respectively. Mixed modeling took into account all the information on covariance and any missing data. The model parameters were estimated by restricted maximum likelihood based on the expectation maximization algorithm, so that missing data did not bias the estimate.

Participant flow and the handling of attrition. The attrition rate for users was 15.7%. With regard to the caseworkers, 40 stayed with the study while three dropped out, marking an attrition rate of 7.5%. For a detailed report on the flow of participants (users and caseworkers), refer to Figures 1 and 2.

The type of missing data was estimated to be missing at random (i.e., data are not systematically missing, and the propensity for those missing data may be correlated with some study-related variables in an analysis). Missing data were well tolerated by mixed modeling, and all cases were retained in the analysis.

Pretreatment Results

Participants' characteristics at pretreatment: Users. Table 1 summarizes the t test and χ^2 test results. These tests were administered to compare all demographic and clinical characteristics at pretreatment. The pretreatment characteristic differences did not reach a level of significance ($p > .05$), with the exception of two variables: The users from the control group had a longer mean time (in months) since the first onset of symptoms of mental illness than the users from the intervention group, and there were significantly more participants from the control group who were not working at the time of pretreatment data collection.

Participants' characteristics at pretreatment: Caseworkers. Table 2 summarizes the t test and χ^2 test results. These tests were administered to compare all demographic and clinical characteristics at pretreatment. None of these pretreatment differences reached the level of significance (all $p > .05$).

Pretreatment differences in outcome measures. Basic t tests were conducted to check for pretreatment differences in all outcome measures of both users and caseworkers. It was found that the self-reported achievement of goals differed statistically at pretreatment, with the intervention group rating themselves higher than the control group in their recovery goals ($p < .05$) but not higher in confidence and self-efficacy. For other outcomes, no pretreatment differences were found. Mixed modeling took the information on covariance into account, and in our results, LS means plots were included where appropriate to examine and explain differences over time. LS means are adjusted for other terms in the model (like covariates) and are also less sensitive to missing data. LS means are thus theoretically a better estimation of true population means (Mertler & Vannatta, 2013).

Main Results

Hypothesis 1: Group Effects: Control Versus Intervention

Users' outcomes are shown in Table 3. Recovery, subjective well-being, therapeutic alliance, states of hope, confidence, and self-efficacy in goal attainment did not change over time. However, psychiatric symptoms, as measured by the Brief Psychiatric Rating Scale (BPRS) $F(1,130.4) = 40.74$, $p < .01$, $d = .64$, 95% confidence interval (CI) = [.44, .84]; the achievement of goals, as rated by users, $F(1,135.0) = 10.80$, $p < .01$; and caseworkers $F(1,114.0) = 4.02$, $p < .05$, $d = .21$, 95% CI [.01, .40]; and employment outcomes, $F(1,401.9) = 29.97$, $p < .01$, differed significantly between the control and intervention groups. Taking into account the group differences at pretreatment, the findings can be summarized as follows: (1) SMCM had negative impacts on psychiatric symptoms with a moderate effect size, meaning that the psychiatric symptoms experienced by the intervention group were moderately higher than those experienced by the intervention group, (2) SMCM had positive impacts on goal
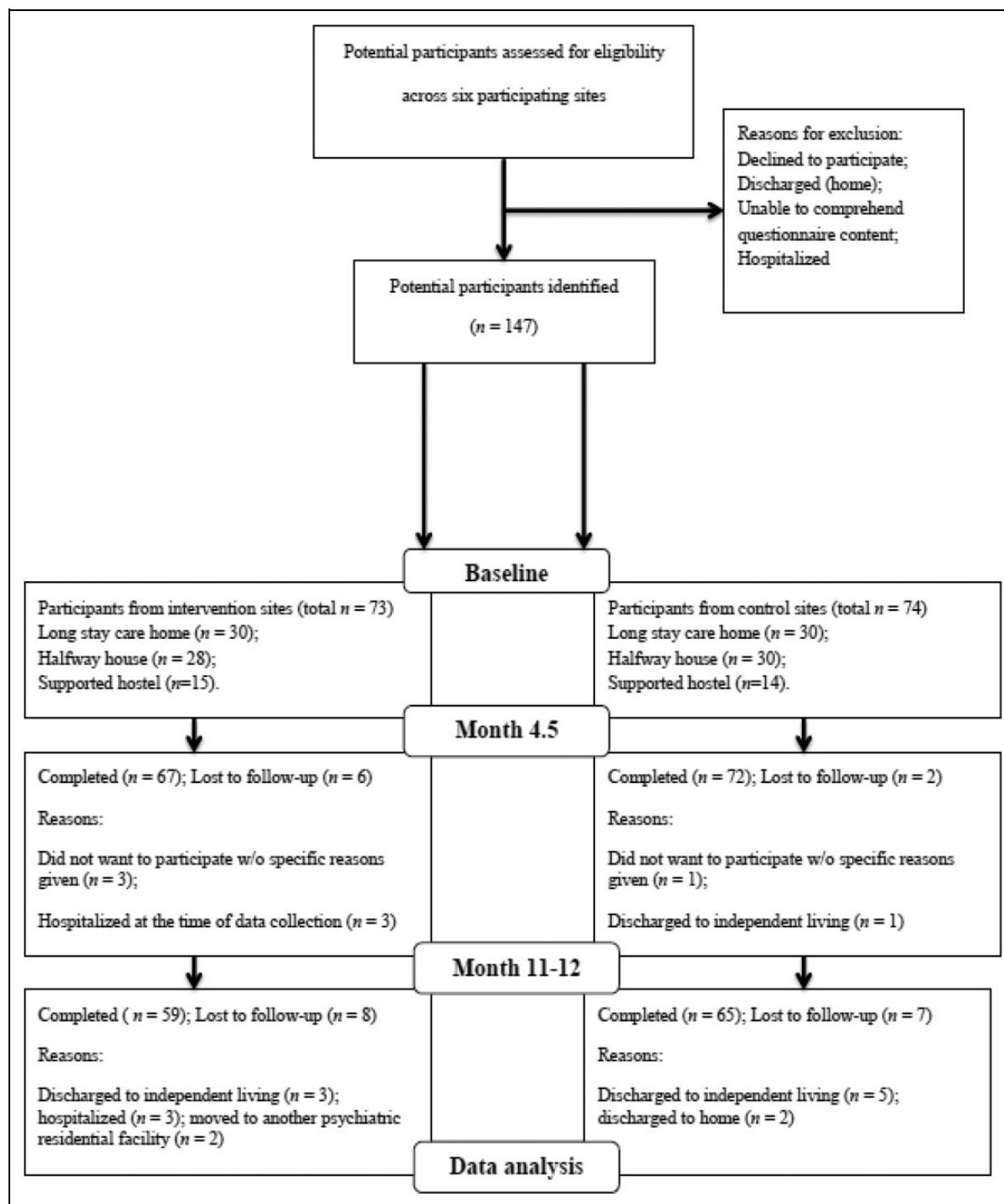
Figure 1. Flow of participants (service users). Dropout from each wave was documented with reasons.

achievements (as rated by the caseworkers) for the intervention group, with a small effect size, meaning that the intervention group had made better progress in achieving their recovery goals compared to the control group, but the difference (in standard deviations unit) was small, and (3) the difference in employment outcomes and self-rated goal achievements was canceled out by the group differences at pretreatment.

Hypothesis 2: Interaction Effects: Groups and Residential Type

Similarly, there were no interaction effects on recovery, subjective well-being, therapeutic alliance, states of hope, confidence, and self-efficacy in goal attainment. However, there was an interaction effect on three outcome variables: psychiatric symptoms, measured using BPRS, $F(2,130.3) = 6.29$, $p <$
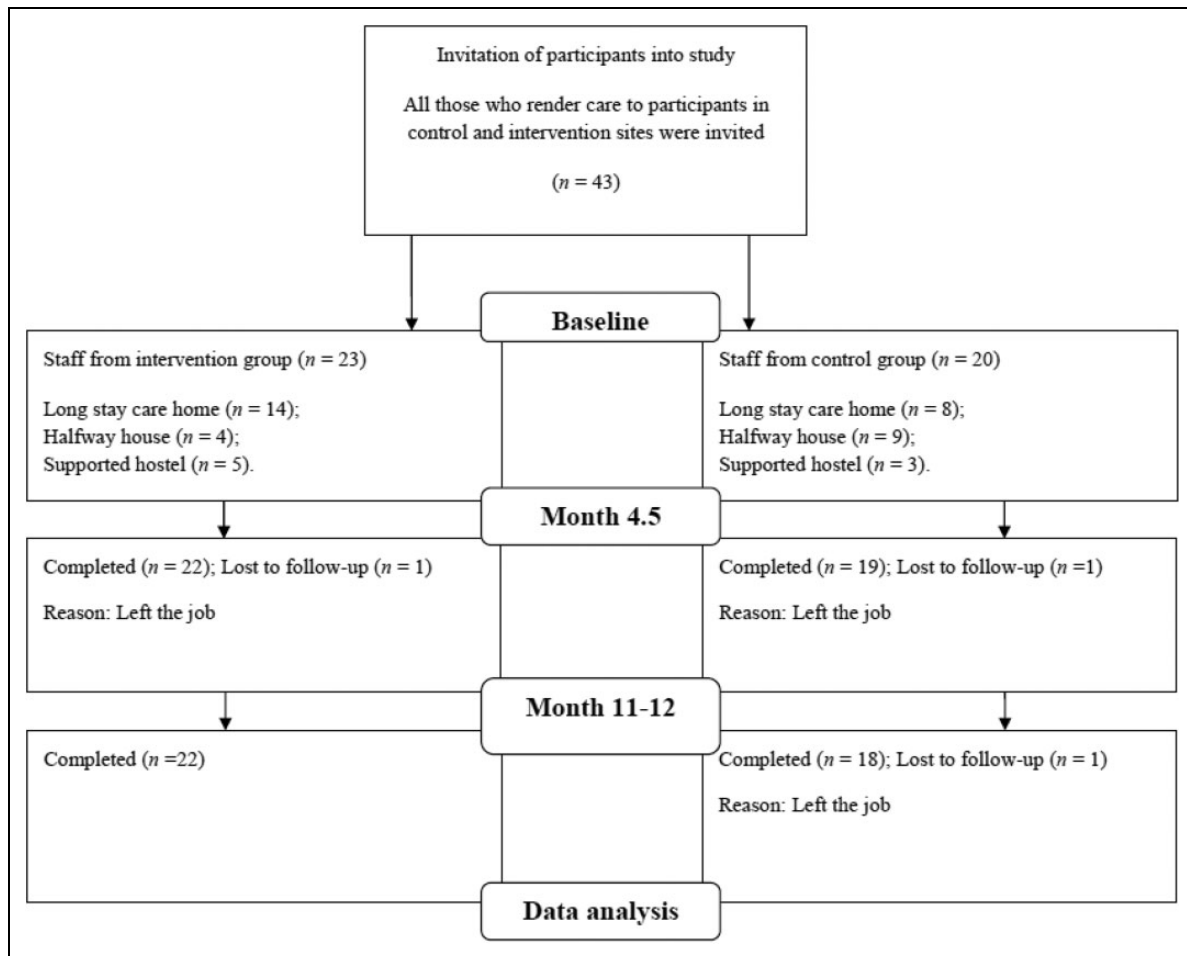
Figure 2. Flow of participants (staff). Dropout from each wave was documented with reason.

.01, $\eta^2 = .22$, CI 95% [.16, .27]; goal achievements, rated by caseworkers, $F(2,114.7) = 23.28$, $p < .01$, $\eta^2 = .18$, CI 95% [.12, .23]; and employment $F(2,404.5) = 6.29$, $p < .01$. Tukey's post hoc test indicated that SMCM negatively impacted psychiatric symptoms for participants in the intervention group and positively impacted goal achievements for those in long-term care homes (moderate fidelity = 60%) and supported hostels (highest fidelity = 80%), both with large effect sizes. Taking into account the group differences in pretreatment, the intervention group presented with more psychiatric symptoms compared to the control group, and the magnitude of the difference between the two groups was large. Furthermore, participants in the intervention group showed much better progress toward achieving their self-defined recovery goals, and the magnitude of this difference was also large. Finally, the effects on employment were canceled out by the group effect.

Hypothesis 3: Association With Intervention Fidelity

In a subgroup analysis using multivariate analysis of variance, in which each residential type was compared against the others, an association of higher fidelity with better outcomes was detected. Only the intervention setting with the highest fidelity

ratings at posttest (80%; supported hostel) was demonstrated to have more favorable users' outcomes in most of the outcome variables (i.e., personal recovery, states of hope, subjective well-being, and therapeutic alliance) compared with the control setting. These favorable trends, though not reaching a statistically significant level, were evidenced by the upward trend as shown in the LS means plots (Figures 3–6). Most notably, participants from the supported hostel (highest fidelity) who received SMCM care, despite beginning with more serious psychiatric symptoms, consistently outperformed their counterparts from the control group, which did not receive SMCM, in all of the psychosocial measures.

Hypothesis 4: Caseworker Outcomes

There was a statistically significant result with a large effect size in the difference of the level of emotional exhaustion, as measured by the MBI between the control and intervention groups, $F(2, 31) = 5.27$, $p < .01$, $\eta^2 = .22$, CI 95% [.09, .29]. There were no statistically significant differences in perceived supervisory support (see Table 4 for the full results for the caseworkers).

Table 1. Pretreatment Demographic Characteristics of Service Users.

Characteristics	SMCM ($n = 73$)	Control ($n = 74$)	t	χ^2	p
Mean age (SD)	46.86 (12.90%)	47.51 (13.71%)	−0.29	—	.77
Sex (female)	34 (46.58%)	30 (40.54%)	—	0.55	.46
Education			—	9.75	.14
Not educated	1 (1.37%)	0			
Primary	8 (10.96%)	15 (20.27%)			
Junior	18 (24.66%)	29 (40.85%)			
Senior	30 (41.10%)	22 (29.73%)			
Matriculated	3 (4.11%)	1 (1.35%)			
Tertiary	9 (12.33%)	6 (8.10%)			
Employment status			—	62.04	<.01**
Not working	25 (6.14%)	77 (18.92%)			
Day training	44 (10.81%)	29 (7.13%)			
Activity center	1 (0.25%)	3 (0.74%)			
Workshop	57 (14%)	47 (11.55%)			
Supported employment	43 (10.57%)	22 (5.41%)			
Open employment	32 (7.86%)	27 (6.63%)			
Marital status			—	2.70	.61
Single	57 (78.08%)	54 (76.06%)			
Married	6 (8.22%)	10 (13.51%)			
Separated	1 (1.37%)	1 (1.35%)			
Divorced	7 (9.59%)	9 (12.16%)			
Widowed	1 (1.37%)	0			
Diagnosis			—	1.11	.57
Schizophrenia	64 (87.67%)	63 (85.14%)			
Bipolar disorder (BP)	3 (4.10%)	6 (8.10%)			
Schizophrenia or BP with comorbidities	6 (8.22%)	5 (6.76%)			
Mean time since first onset (in months; SD)	242 (127.65)	274.20 (162.11)	−2.17	—	<.05*
Currently on medication	73 (100%)	73 (98.65%)	—	1.38	.24
Suffered relapse in recent 3 months	2 (2.74%)	4 (5.40%)	—	0.68	.41
BPRS* (M, SD)	38.83 (11.42)	35.41 (13.45)	1.64	—	.10

Note. SD = standard deviation; BPRS = Brief Psychiatric Rating Scale; SMCM = strengths model of case management.
*Significance at $p < .05$. **Significance at $p < .01$.

Table 2. Pretreatment Demographic Characteristics of Staff Members.

Characteristics	SMCM ($n = 23$)	Control ($n = 20$)	t	χ^2	p
Mean age (range, in years)	35–44	35–44	—	—	—
Sex (female)	15 (65.21%)	8 (40%)	—	0	.93
Position			—	10.97	.20
Registered social worker	7 (30.43%)	12 (60.00%)			
Warden	8 (34.78%)	3 (15.00%)			
Welfare worker	2 (8.70%)	4 (20.00%)			
Program worker	2 (8.70%)	0 (0.00%)			
Nurse	4 (17.39%)	1 (5.00%)			
Mean years of clinical experience (SD*)	9.8 (10)	9 (7.4)	0.27	—	.78

Note. SD = standard deviation; SMCM = strengths model of case management.

Discussion and Applications to Practice

SMCM was shown to be ineffective in enhancing the recovery of individuals as measured by MARS, which is the primary outcome of this study. There were also null findings with regard to outcomes in subjective well-being, states of hope, work alliance, and employment, but SMCM was effective in improving goal achievements as rated by the case managers. In addition, SMCM was shown to have a negative impact on psychiatric symptoms for participants in the intervention group. SMCM was effective in reducing emotional exhaustion for caseworkers providing strengths-based care but ineffective in enhancing perceived support from supervisors. Lastly, high fidelity was shown to be associated with improved client outcomes over time, even though such effects did not reach a statistically significant level for some dependent variables. The positive and null findings, the limitations of the research, the theoretical contributions, and the applications to practice of the present study are discussed below.

SMCM is a case management approach that encourages progress and movement toward living a more meaningful life as defined by the person. It places a strong emphasis on facilitating clients' (re)integration into their communities through goal-directed behavioral changes. It is unsurprising that the service users in the SMCM group were more able to achieve

Table 3. Descriptive Statistics and Mixed Model Results Comparing Means Between Groups Over Three Time Points (Service Users).

		Intervention				Control			Mixed model	
									Group	Group × Residential Type
		T1	T2	T3		T1	T2	T3		
Scale	n (T1)	M (SD)	M (SD)	M (SD)	n (T1)	M (SD)	M (SD)	M (SD)	p	
BPRS	72	38.83 (11.42)	30.59 (14.71)	36.55 (11.89)	71	35.41 (13.45)	40.68 (12.38)	26.37 (8.38)	<.01**	<.01**
MARS	72	131.15 (21.75)	132.55 (25.83)	131.58 (26.09)	71	129.87 (23.70)	130.71 (23.48)	136.35 (23.05)	.57	.11
SH	72	33.51 (7.72)	31.94 (8.81)	34.81 (8.87)	71	33.07 (8.47)	34.71 (8.64)	35.95 (6.94)	.68	.65
SWLS	72	23.42 (6.55)	24.32 (6.68)	23.46 (7.82)	71	24.03 (6.02)	23.57 (6.49)	24.89 (5.65)	.91	.27
WAI	72	56.68 (12.17)	54.01 (15.69)	57.00 (12.25)	71	53.80 (12.07)	51.97 (11.74)	56.75 (11.69)	.34	.36
Goals (self)	70	15.31 (5.76)	16.71 (4.95)	17.48 (4.07)	58	11.12 (6.35)	14.77 (6.12)	15.27 (4.55)	<.01**	.86
Confidence in goals	58	2.35 (0.68)	2.23 (0.69)	2.36 (0.66)	58	2.46 (0.56)	2.38 (0.64)	2.43 (.59)	.06	.35
Self-efficacy in goals	58	1.06 (0.24)	1.06 (0.24)	1 (0)	58	1.06 (0.24)	1.05 (0.21)	1 (0)	.81	.42
Goals (CM)	70	8.89 (5.69)	11.11 (8.07)	12.29 (7.20)	71	9 (4.52)	11.14 (5.88)	7.89 (6.56)	<.05*	<.01**
Employment	72	4.13 (1.40)	4.13 (1.40)	3.88 (1.56)	71	3.24 (1.83)	3.24 (1.83)	3.10 (2.02)	<.01**	<.01**

Note. BPRS = Brief Psychiatric Rating Scale; MARS = Maryland Assessment of Recovery in People with Serious Mental Illness; SH = State of Hope; SWLS = Satisfaction with Life Scale; WAI = Working Alliance Inventory; CM = case worker.
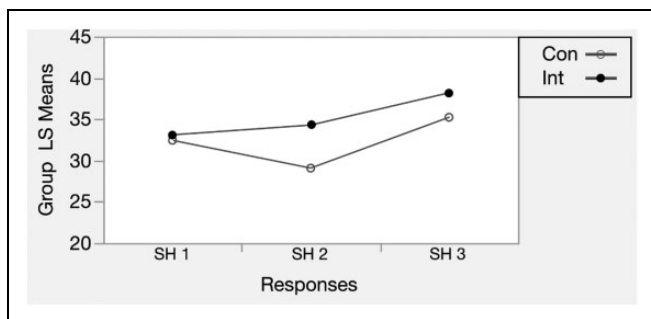*Significance at p < .05. **Significance at p < .01.
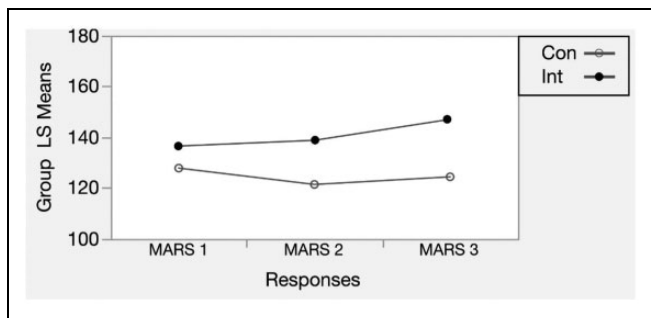
Figure 3. Least square means plot showing personal recovery outcome change over Time × Group (supported hostel, control vs. intervention).
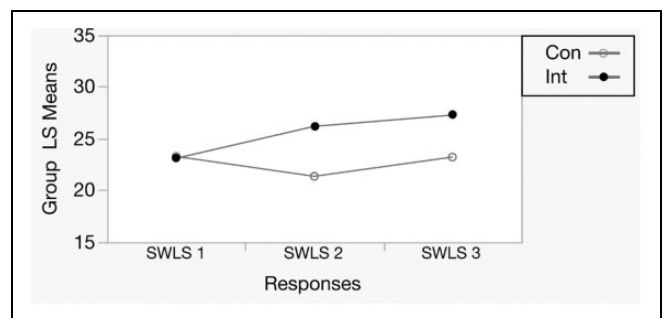
Figure 5. Least square means plot showing subjective well-being change over Time × Group (supported hostel, control vs. intervention).

Figure 4. Least square means plot showing state of hope change over Time × Group (supported hostel, control vs. intervention).
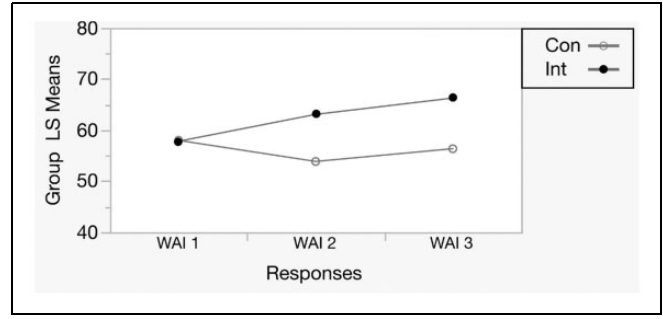
Figure 6. Least square means plot showing work alliance change over Time × Group (supported hostel, control vs. intervention).

the set goals than those in the control group as rated by their caseworkers. Having goals or expecting to attain a goal is a catalyst for hope (Snyder & Taylor, 2000). In our study, we incorporated both standardized measures and self-constructed goals achievement measures to gauge the impact of SMCM. It was shown that SMCM improves goals achievement in users and that this effect was particularly apparent in high-fidelity settings (i.e., supported hostels).

Table 4. Descriptive Statistics and Analysis of Variance (ANOVA) Repeated Measures Results Comparing Means Between Groups Over Three Time Points (Staff).

		Intervention				Control			ANOVA Repeated Measures	
									Time ×	
		T1	T2	T3		T1	T2	T3	Group	Group
Scale	n	M (SD)	M (SD)	M (SD)	n	M (SD)	M (SD)	M (SD)	p	
MBI (overall)	23	58.43 (5.49)	59.82 (4.34)	58.71 (8.89)	20	60.00 (5.83)	60.42 (5.17)	60.47 (7.77)	.54	.96
Emotional exhaustion	23	20.65 (3.58)	20.41 (3.02)	19.57 (4.62)	20	21.75 (3.40)	21.42 (3.11)	21.84 (4.62)	.54	<.01**
Personal accomplishment	23	17.94 (4.36)	18.64 (3.06)	20.23 (5.43)	20	19.17 (3.67)	19.57 (3.49)	19.81 (4.18)	.13	.94
Depersonalization	23	20.39 (2.25)	20.59 (1.74)	19.22 (3.14)	20	19.41 (2.28)	19.77 (2.58)	18.03 (2.67)	.94	.96
PSS	23	73.39 (13.80)	69.77 (13.12)	71.43 (17.62)	20	75.11 (12.32)	78.32 (18.21)	74.11 (19.85)	.45	.08

Note. MBI = Maslach Burnout Inventory; PSS = Perceptions of Supervisory Support Scale; SD = standard deviation.
*Significance at $p < .05$. **Significance at $p < .01$.

The results with regard to the caseworkers suggested that emotional exhaustion was significantly lower for the SMCM group. To the best of our knowledge, this was the first trial to measure the impact of SMCM on caseworkers' job burnout. We postulate that certain elements within the SMCM intervention may be conducive to the well-being of caseworkers; for example, an emphasis on team collaboration, and the overall empowering culture may affect caseworkers positively in terms of their sense of self-efficacy and confidence in delivering treatment, thus lowering their burnout (Kraus & Stein, 2013). Future research is thus required to look at the individual and organizational changes following the adoption of a recovery culture and how these changes may be related to the well-being of caseworkers.

However, broadly speaking, there are two null findings we should discuss. First, from the first level of analysis when fidelity was not taken into account, we were not able to detect any significant improvement in personal recovery, our primary outcome, and indeed in other measures (e.g., subjective well-being and states of hope). As a process, recovery has yet to be fully grasped; as an outcome, it is difficult to measure. In the recovery paradigm, every individual's journey to recovery is seen as highly idiosyncratic and incremental in nature. While changes in the objective dimensions of a person's life may be easily quantifiable with functional outcomes such as goal attainment, the subjective dimensions of a person's life are not readily observable (Anthony, 1993; Hasson-Ohayon, Roe, Yanos, & Lysaker, 2015). Alternative and perhaps more creative approaches, such as semistructured qualitative interviews or tailor-made goal completion ratings, may be desirable to capture and express the nuances associated with a person's changing and dynamic recovery journey. Consistent with the general ethos of social work, SMCM is a client-centered approach, and therefore, individualized measures (i.e., where users describe aspects of their lives that are meaningful and purposeful to their identity, which are also affected by health, and then link them to strength profiles) could be considered.

More pragmatic outcomes, such as client satisfaction or service utilization rates, might also be included (Lindhiem, Bennett, Trentacosta, & McLear, 2014). Second, the psychiatric symptoms were surprisingly worse in the intervention group over time, which nevertheless was consistent with at least one previous study (Björkman et al., 2002). The reason behind this phenomenon is not commonly documented in the recovery literature. The three authors of this article who are primarily clinicians (SKC, EW, and SW) suspected the elevated level of symptoms could be due to the nature of SMCM. Like any recovery-oriented practice where service users set goals, they may exceed their comfort zone, seizing the moment to embark on a therapeutic risk-taking journey (Felton, Wright, & Stacey, 2017; Shepherd, Boardman, & Slade, 2008; Tew et al., 2011), which could cause a considerable level of stress for service users.

Overall, the present study makes conceptual contributions and raises important questions about recovery and strength-based practice. First, our results showed initial evidence that SMCM may be effective in improving the functional recovery of an individual (Leonhardt et al., 2017), whereas its effectiveness in promoting the personal recovery of individuals could not be demonstrated. Indeed, functional recovery and personal recovery are related but distinct aspects of recovery in general (Tse, Davidson, Chung, Ng, & Yu, 2014). Both forms of recovery constitute a holistic experience in which people in recovery may experience and relate to their mental illness (Davidson, O'Connell, Tondora, Lawless, & Evans, 2005). The directionality of the causal link (if any) between functional and personal recovery and how such a link may be effectively invoked using an intervention still remain unknown. Second, fidelity was monitored at all three of the intervention sites, but only one intervention site (supported hostels) succeeded in achieving a high overall fidelity score (an average of 4/5 in all of the core items). Consistent with the earlier work of Fukui et al. (2012), in the high-fidelity setting of the present study, improvements were found in the psychological processes of service users and

in their relationships with their caseworkers (therapeutic alliance). To the best of our knowledge, this is the first study that has provided preliminary evidence to support the finding that high-fidelity SMCM can have a positive impact on service users' outcomes to have been completed outside the United States within a different health-care system (e.g., Hong Kong has a much higher caseload for community psychiatric social workers with only 5.9 social workers per 100,000 population as compared to 17.93 social workers per 100,000 population in the United States as of 2011; Word Health Organization, 2011). Having said that, the specific barriers to, and facilitators for, achieving high-service fidelity scores are highly nuanced and depend on the settings and their organizational cultures. Caseworkers' accounts of their recovery-oriented practice revealed that flexibility in work organizations and institutional norms often impact social workers' capacities to carry out their work with users (Khoury & Rodriguez del Barrio, 2015). Therefore, further research is warranted to explore the organizational or managerial characteristics that may impact the fidelity of SMCM interventions and indeed the effectiveness of the model.

Both the positive and null findings of this study should be interpreted cautiously given the limitations of our design. This study was a nonrandomized study with a modest sample size. The lack of strong statistical power may explain the inability to detect significant results in some variables. In terms of representativeness, the participants from this study were all recruited from supported accommodation for people with psychiatric disabilities, thus limiting the generalizability of results to users of wider community mental health services. Notwithstanding this shortcoming, this study drew from three of the most prominent NGOs in Hong Kong (serving over 5,000 people) and our participants were representative of all ages (range in years = 21–78). This makes the study a good starting point for more large-scale research, possibly extending to people with severe mental illness in the community. Although it was not part of the present findings, practitioners should be cautioned that the strengths-based approach must not be used as the sole intervention choice without regular psychiatric care for people with severe psychotic symptoms (e.g., delusion and paranoia) and high suicidal risk (Taylor, 2006; Tse et al., 2016).

This study has two important implications for practice. First, strengths-based mental health care is regarded as a hallmark of recovery-oriented services (Davidson et al., 2007; Slade et al., 2014). Social workers play a vital role in promoting recovery among people with severe mental illness (Webber & Joubert, 2015). As agents for policy change and social justice, social workers need to critically examine the existing practice frameworks used by their organizations, which often focus on symptoms reduction, and facilitate a paradigm shift toward supporting clients to achieve their recovery goals (Carpenter, 2002; Webber & Joubert, 2015; Weick et al., 1989). In addition, at a frontline, clinical level, social workers need to empower clients to explore, develop, and mobilize their strengths in various domains (e.g., occupation, managing wellness, and finance) far beyond merely reducing psychiatric symptoms. As advocates for the clients, social workers need to make the individuals' stories of aspiration and achievement heard by other stakeholders, so that the wider public can better understand what helps people recover from severe mental illness and create a more hope-inducing and socially inclusive community.

Second, staff burnout has been a common challenge to mental health professionals and can be attributed to both institutional and personal characteristics (Paris & Hoge, 2010; Pines & Maslach, 1978; Thompson, Amatea, & Thompson, 2014). Research has even found that the burnout rates of social workers in mental health settings have been higher than for other mental health professionals (Evans et al., 2006; Lasalvia et al., 2009). High job demands and low job satisfaction were found to be closely associated with this phenomenon, along with other factors such as a heavy workload and low control over their work (Evans et al., 2006; Ray, Wong, White, & Heaslip, 2013; Siebert, 2006). Our findings showed a significantly lower level of emotional exhaustion among caseworkers who adopted SMCM than among their counterparts. We speculate that the changes in the workplace or the intervention sites brought about by the adoption of SMCM did not only benefit the users but also prompted the social workers to engage their users from a strengths perspective that was satisfying and in tune with the values and vision of the social work profession. This interpretation calls for further research to develop an in-depth understanding of the caseworkers' experiences during the process of practice.

To conclude, the present work is the first published study outside of the United States to comprehensively examine the effects of SMCM for users residing in supported accommodation and for caseworkers, using control group with fidelity monitoring before and during the intervention. It sheds light on the concept of personal and functional recovery in a non-Western context. This is a pragmatic, nonrandomized controlled study; thus, we encourage future clinical trials to be conducted at multiple sites with high fidelity, using a block randomization design to further extend the current findings. Finally, it is worth noting that this study had a high retention rate (85%), which could be attributed to (1) the prospective research participants being "captive research participants," as they reside at the research sites, (2) participants having good rapport with the peer research assistants who were responsible for collecting the data, and (3) the intervention being potentially acceptable to the participants. However, little is known about the notion of "strengths" in non-Western service contexts and how a clinician may elicit strengths from a Chinese service user compared to their counterparts from different cultural backgrounds. Chinese people, for example, have been found to be less forthcoming or comfortable with regard to mentioning their own strengths or successes (Tse, Divis, & Li, 2010). Understanding the cultural elements in relation to strengths-based intervention is another important direction for future research.

Declaration of Conflicting Interests

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Supplemental Material

Supplemental material for this article is available online.

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