This is an Accepted Manuscript of an article published by Taylor & Francis in Child & Youth Services on 25 Jul 2022 (published online), available at: http://www.tandfonline.com/10.1080/0145935X.2022.2100756.

Title Page

Title: Reengaging youth with prolonged social withdrawal behaviours in Hong Kong: Efficacy of an intervention programme involving human and nonhuman partners

Authors:

1st author

Paul, W.C. WONG, Department of Social Work and Social Administration, The University of Hong Kong, Pokfulam, Hong Kong SAR

Email: paulw@hku.hk

2nd and corresponding author

Xuebing SU, Department of Applied Social Sciences, The Hong Kong Polytechnic Univesity, Hunghom, Hong Kong SAR

Email: sabrina-xuebing.su@polyu.edu.hk

3rd author

Rose, W. M. YU, Department of Social Work and Social Administration, The University of Hong Kong, Pokfulam, Hong Kong SAR

Email: yuwaiman@hku.hk

4th author

Tim, M. H. LI,

Department of Psychiatry, The Chinese University of Hong Kong, Shatin, Hong Kong SAR

Email: manholi@cuhk.edu.hk

Correspondence

*Correspondence regarding this article should be addressed to Dr. Xuebing SU, Department of Applied Social Sciences, The Hong Kong Polytechnic University, 11 Yuk Choi Road, Hung Hom, Kowloon, Hong Kong SAR. Email: sabrina-xuebing.su@polyu.edu.hk

Author contributions:

Paul, W.C. WONG: Designed the research study, collected data, and drafted the manuscript.

Xuebing SU: Developed the conceptual framework based on the concept of more approachable others, conducted data analysis, drafted and edited the manuscript.

Rose, W. M. YU: Designed the research study, conducted data cleaning, and co-drafted the manuscript.

Tim, M. H. LI: Designed the research study and co-drafted the manuscript.

Conflict of interest:

There is no conflict of interest to report.

Ethics approval statement & consent form

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Research Ethics Committee of the University of Hong Kong. All participants were well informed about the objectives of the research and signed a consent form before joining the research.

Acknowledgements:

We thank all the volunteer nonhuman animals and guardians of the animals participating in the programme. And most importantly, we thank all the colleagues from the Chinese Evangelical Zion Church who made this research possible. In delivering these services, the RM programme also worked in partnership with several NGOs: the Richmond Fellowship of Hong Kong providing clinical psychology services, the Hong Kong Animal Therapy Foundation and Fat Fat the therapy dog providing AAT supervision intervention and the Animals Asia Foundation, and the Mongrel Club providing nonhuman animal visitations.

Data available on request from the authors

The data that support the findings of this study are available from the first author upon reasonable request.

Reengaging youth with prolonged social withdrawal behaviours in Hong Kong: Efficacy of an intervention program involving human and nonhuman partners

Abstract

This study examined the efficacy of a multicomponent intervention program for reengaging youth with prolonged social withdrawal behaviours (YPSW) in Hong Kong. Highlighting the involvement of more approachable others encompassing human and nonhuman partners, the intervention program included case work, group work, and transitional support activities for re-connecting YPSW to community. It turned out that 125 participants, counting as 75% of all participants, who were not in education or employment before enrolling into the program, have managed to find a full-time (i.e. 28.8% of all participants) or part-time (11.2%) job, or resume schooling (35.2%) after going through the program. Significant pre-post changes were identified in terms of reduced socially withdrawn behaviours and social interaction anxiousness, and enhanced self-esteem and perceived self-employability. The paper discussed the implications for informing multi-component intervention work and research study for reengaging YPSWs accordingly.

Keywords: youth with prolonged social withdrawal behaviours, hikikomori, human and nonhuman partners, animal-assisted intervention, more approachable others

Reengaging youth with prolonged social withdrawal behaviours in Hong Kong: Efficacy of an intervention program involving human and nonhuman partners

The problem of prolonged social withdrawal behaviours among young people has been attracting growing public and academic attentions in many high-income societies (Rooksby et al., 2020; Wu et al., 2020). Youth with prolonged social withdrawal behaviours (YPSW), also known as hikikomori in Japan (Saito & Angles, 2013), refers to young people who have been suffering from prolonged self-seclusion behaviours of avoiding face-to-face social interactions with people other than their family members, and disengaging themselves from participating in formal institutions of education, employment or training (Wong, 2009).

Epidemiological research studies conducted with reference to the general population have reported that the prevalence of YPSW can reach an approximate range of 0.87%-1.2% in Japan (Koyama et al., 2010), 1.9% in Hong Kong (Wong et al., 2015), and 2.3% in Korea (Lee et al., 2013). Existing literature has revealed the negative consequences of prolonged withdrawal behaviours caused for young people themselves, their family members, and society at large (Li & Wong, 2015a). Yet a thorough study of the effectiveness of interventions to reengage YPSW and support their transition to work or education is still lacking. This study aims to test the efficacy of a reengaging intervention program for YPSW, which is characterized by the involvement of human

and nonhuman partners as more knowledgeable others.

YPSW and consequences of prolonged withdrawal behaviours

Prior studies have revealed that in Hong Kong, YPSW may spend most of their time in their comfort zone which is largely confined to their home, their bedroom or even their bed, although some youth may step out of their home for a stroll or go shopping alone in silent streets in unsocial hours (Wong, 2009, 2012). YPSW may suffer from long-term and severe social withdrawal if no professional intervention is to be offered to them (Wong, 2009). Lacking face-to-face social interaction for six months or above, YPSW may show increased social interaction anxiety, decreased self-efficacy, and strong resistance to reengagement in society, and thus harm their positive development (Wong, 2012). The phenomenon will also cause economic and sentimental burdens to the family, and bring a great cost to society at large (Li & Wong, 2015a).

Complex reasons leading to prolonged social withdrawal behaviours and challenges of reengaging YPSW

The development of socially withdrawn behaviours has been found to associate with different factors, namely, biological (Hayakawa et al., 2018), developmental (e.g., attachment) (Krieg & Dickie, 2013), psychological (e.g., attachment issues, personality) (Li & Wong, 2015a), psychiatric (e.g., autism spectrum disorder, depression, internet addictive disorder, social anxiety) (Pozza et al., 2019; Tateno et al., 2019; Teo et al., 2020), and sociocultural (e.g., the mainstream

culture, academic and parental expectations imposed on students) (Toivonen et al., 2011). A cross-cultural study shows that the typical onset of socially withdrawn behaviours is in late adolescence and early adulthood and is often followed by an experience of shame or socio-culturally defeating events (e.g., bullying, failing key academic examinations, not getting an expected level of employment) (Li & Wong, 2015a). The negative social experiences encountered by YPSW appear to highlight the importance of rebuilding positive social interactions for reengaging these young people.

Some recent studies (Su et al., 2020a, 2020b) have pointed out that the reengagement of disengaged young people such as YPSW is particularly difficult in view of the hostile mainstream culture, which has put a premium on paid work experiences and educational credentials. Under such circumstances, the public may be hostile to YPSW and take these young people as social burdens. YPSW themselves and their significant others such as their family members and friends may also take the mainstream social discourse to stigmatize and demoralize the status of prolonged social withdrawal at home (Su et al., 2021). In this connection, to create an enabling environment with a friendly climate for YPSW is perceived very important for reengaging these young people in terms of the reestablishment of social interactions in diverse organizational and community settings.

It is generally agreed that there is a severe lack of evidence-based practices for reengaging

YPSW (Li & Wong, 2015a, Chan & Lo, 2014a). The conventional pathways to reengage these disengaged young people by means of pushing them back to school or work are unlikely to be effective (Rooksby et al., 2020), particularly in view of the reluctance of YPSW to engage in social interaction and seek help from others (Wong, 2020). Most of the reengagement programs targeting YPSW aim to support these young people to regain face-to-face interactions with people other than their family members, join activities outside their homes and regain a new status in education, employment, or training for the sake of promoting the positive youth development and well-being of the YPSW (Wong et al., 2015). Yet, all these goals particularly the last challenging one regarding the achievement of a new social status as a student, worker or trainee are less likely to happen if professional interventions do not start where the YPSW are (Su et al., 2021; Su & Wong, 2022).

Despite of the complex and heterogeneous nature of antecedents leading to the YPSW phenomenon and the challenges of reengaging YPSW back into the community, there are some preliminary evidence showing that some interventions such as online counseling, psychotherapy, and residential care are helpful for the YPSW to have societal reengagement (Chan & Lo, 2014a, 2016; Nishida et al., 2016; Wong et al., 2019), and these interventions are characterized by the involvement of social workers, counsellors or mentors, who are more likely to take proactive actions to interact YPSW in a friendly manner and work step by step to gradually involve them into more social interactions (Wong, 2014).

Reengaging YPSW with the involvement of more approachable others (MAO)

According to Vygotsky (1978), social interaction is very important for enhancing the learning process of children. Vygotsky (1978:86) emphasized that by supporting young people in the zone of proximal development (ZPD), more knowledgeable others (MKO) can help them increase their level of potential development, learn new skills, and solve problems more quickly than when they work independently. ZPD refers to the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers (Vygotsky, 1978). MKO can be an adult or an older peer who has a higher ability level than the learner in a certain area of learning with respect to a particular task, process, or concept.

However, the involvement of MKO may not be appropriate at the early stage of reengaging YPSW as these young people have spent most of their time in their own comfort zone and are inclined to resist face-to-face interaction with people from the outside world, and thus it is more preferable to engage them with more approachable others (MAO) (Wong, 2012). MAO may not be necessarily more knowledgeable than YPSW, but they are able to show friendliness, support and acknowledge their need of privacy and comfort zone when taking proactive actions to interact with them. MAO enlisted for extending support to people in need in intervention programs can refer to human and/or nonhuman partners (see Barad, 2012; Simonato et al., 2020). Human

partners can be helping professionals such as social workers or non-/para-professionals such as mentors having similar interest with the YPSW (see Cruz et al., 2020); whereas nonhuman partners normally refer to animals such as dogs and cats involved in providing animal-assisted interventions (see Dimolareva & Dunn, 2020).

In the past decade, youth work practitioners such as social workers have been playing the role of MAO in working with YPSW in the initial stage of intervention in Hong Kong (Wong, 2012) with support from nonhuman MAO of assisted canines or horses (Chan & Lo, 2014a; Wong et al., 2019). For example, a pilot multicomponent program with a case management model and animal-assisted interventions named "Regain Momentum (RM)" was developed and delivered to 56 YPSW in Hong Kong between 2010 and 2012. Assisted animals were introduced in the RM program as MAO for the following reasons: first, the non-judgmental attributes of the nonhuman animals, in particular dogs, may create a calming effect that may help to ease the anxieties of YPSW during an intervention on a one-on-one basis or in group situations (Kruger & Serpell, 2010); second, the nonhuman animals may play the therapeutic function of facilitating prosocial emotions or behaviours of the clients which are favorable to establishing initial working relationship between the youth and the helping professionals (Coe et al., 2009); and last but not least, previous research has shown that animal-assisted interventions have a positive impact on those young people with mental health challenges (Matuszek, 2010). Wong et al. (2019) has found

that the program was correlated with increased levels of self-esteem and perceived employability, and a decreased level of social interaction anxiety at the stage of post-intervention follow-up.

This program highlights the importance of involvement of social workers and assisted canines as MAO in casework, group-work and transition-support-activity settings for reigniting the motivation of YPSW and reengaging them in the community. The purpose of this paper is to report the efficacies of the fine-tuned RM program delivered between 2013 and 2018 on the changes of socially withdrawn behaviours and disengaged social status among YPSW in Hong Kong.

Methods

Participants were recruited through referrals from parents, non-governmental organizations, schools, and the hotline inquiry service. To recruit more participants, the following efforts were made: (1) promoting the program as one of the few programs that provide support to young people with prolonged withdrawal behaviours. Since many of those service agencies may not have the resources to provide long-term assistance to these young people, they would refer cases to our program; (2) making use of traditional and social media to promote our program and invite young people who had completed their user journey and consented to take media enquiries to inspire other YPSW to seek for help; and (3) providing seminars for parents of YPSW and exploring if they could encourage their children to join our program.

Participants included young people aged 15-29, who were suspected of (1) having socially

withdrawn behaviours for three months or more; (2) with difficulties of having meaningful social relationship with others in the eyes of the beholders; and/or (3) with significant impairment of functioning and distress of playing age-appropriate roles (i.e., students or employees) during 2013-2018. Unlike other places, Hong Kong has adopted a period of three months or above as one of the criteria for defining whether young people are in the state of having prolonged social withdrawal for the sake of achieving earlier identification and providing accessible interventions accordingly (Wong. 2009). All procedures performed in studies involving human participants were in accordance with the ethical standards of the Research Ethics Committee of the University where the first author is affiliated to. All participants were well informed about the objectives of the research and signed a consent form before joining the research.

Participants

Table 1 presents the characteristics of the participants, including their sociodemographic characteristics (i.e., gender, age, educational attainment, and living arrangement), duration of withdrawn behaviours, confirmed diagnosis of mental health disorders, and experience of having a pet. Among the 175 young people participated in the study, 64% (n=112) were males. Almost half (43.4%) of the participants were aged 15-19. Nearly 90% of the participants had attained education of Secondary 6 or below (88.5%) and were living with others including their parents (89.1%). Over half (63.4%) of the participants had prolonged withdrawal behaviours for one year

or above.

<Insert Table 1 about here>

Procedures

Refer to Figure 1 on the flowchart of the RM program. The program was delivered by a team of registered social workers in consultation with the research team and a psychiatrist. After initial screening by the intake social worker, individuals requiring further mental health assessment were referred to a clinical psychologist. Young people assessed by the clinical psychologist to manifest active symptoms of mental health conditions were excluded and referred to other appropriate services. Eligible individuals then worked with a designated caseworker on their multicomponent individual intervention plan. There were four intervention components, which constructed three major types of interventions in the program targeted at YPSW:

(i) *Casework* was the core component in the intervention process. The social worker played a dual role of counsellor-case manager on issues around the individual's socially withdrawn behaviours to develop goal-oriented intervention plan and strategies during the process.

(ii) *Psycho-education support group* aimed to encourage young people to engage in face-to-face social interactions and develop peer support in a safe environment. Activities in the group were centered on developmental issues such as self-understanding, values, life goals, etc. This was

an open group where participants could join when needed.

(iii) *Animal-assisted intervention* was included as an innovative and adjunct intervention strategy specifically for this group of young people to enhance the engagement process. Two local NGOs providing trained assisted canines were collaborators in this component. An assisted canine at the youth center helped the social worker to engage the young people, especially at the early stage of the intervention. The inclusion of the assisted canines as nonhuman MAO was developed at the casework or group work level depending on individual preferences and needs. In casework or group work, social workers encouraged the youth participants to take the assisted canines as companionship, facilitated the youth participants to touch, observe, take care of, or play with the assisted canines. In order to enhance the social interaction skills of the youth participants, social workers also observed the interactions between the youth participants and the assisted canines and archived their observations. The social workers facilitated the youth participants to review their interaction with assisted canines by referring to their observation records.

(iv) *Transition support activities for re-connecting the youth participants with community* were implemented. Two kinds of workplace trainings were provided. A four-day course on animal-grooming where participants learned basic animal-grooming techniques from a qualified instructor. Work placement at an office setting aimed to provide actual work experience for the individual both in general office duties as well as taking care of an on-site service dog. To ensure the quality

and consistency in the intervention, a monthly case conference chaired by a psychiatrist equipped with knowledge on animal-assisted intervention was conducted to provide peer supervision. Animals showing up in the pet grooming training or work placement were also nonhuman MAO for the youth participants.

<Insert Figure 1 about here>

Measures

As disengaged social status and socially withdrawn behaviours are two core characteristics of YPSW, we used social status and socially withdrawal behaviours as primary outcomes for measuring the pre- and post-intervention changes of the youth participants. Secondary outcome variables included self-esteem, employability self-efficacy, and social interaction anxiety.

Social status as a primary outcome: Participants were asked to self-report their social status including (1) full-time/part-time employment, (2) education, or (3) not in employment or education at all at intake and follow-up stages after the intervention.

Socially withdrawn behaviours as primary outcomes: Four items about their socially withdrawn behaviours developed by Teo and Gaw (2010) for research studies and adapted in a local prevalence study in 2014 (Wong et al., 2014) were included in the intake and exit assessments. The four items of five-point Likert scale were as follows: (1) spending most of the day and nearly

every day confined at home; (2) persistently avoiding social situations (such as going to school or working) and social relationships (such as friendships and contact with family members); (3) not leaving room or place of residence for school or work; and (4) feeling embarrassed in social interaction. A higher score indicates more severe condition of social withdrawal. The Cronbach's alpha for this scale is .57 in pre-intervention questionnaire and .67 in post-intervention questionnaire for the present sample.

Self-esteem as a secondary outcome: Rosenberg Self-Esteem Scale (RSES) - The RSES is a widely used instrument to measure an individual's sense of self-worth. It consists of 10 items regarding both positive and negative feelings about the self. All items are answered using a four-point Likert scale that ranges from strongly agree to strongly disagree with the corresponding statement. Scores range from 0 to 30, and a higher score indicates higher self-esteem with the cut-off for high self-esteem being 15; for instance, individuals scoring less than 15 are considered to have low self-esteem (Rosenberg, 1962). The Cronbach's alpha for this scale is .85 in both pre- and post-intervention questionnaire for the present sample.

Employability self-efficacy as a secondary outcome: Perceived Employability Self-Efficacy Scale (PESES) is a 14-item self-report test designed to measure participants' beliefs about their ability to successfully deal with situations and act in ways that facilitate their career development (Daniels et al., 1998). A five-point Likert scale was used to indicate their perceived capability in

accomplishing job-related tasks. Scores range from 15 to 75 and a higher score indicates a participant's stronger belief in his/her ability to accomplish those tasks (Daniels et al., 1998). The Cronbach's alpha for this scale is .91 in pre-intervention questionnaire and .90 in post-intervention questionnaire for the present sample.

Social interaction anxiety as a secondary outcome: Interaction Anxiousness Scale (IAS) is a 15-item self-report measure that assesses the dispositional social anxiety of an individual. The items relate to subjective feelings of anxiety and are answered on a five-point Likert scale. The score ranges from 15 to 75, and a higher score indicates a higher level of social anxiety. In a sample of over 1,000 students in three U.S. universities, the mean value was 38.9 (Robinson et al., 1991). The Cronbach's alpha for this scale is .86 in pre-intervention questionnaire and .85 in post-intervention questionnaire for the present sample.

Dosage of intervention: Social workers reported frequencies of sessions of three types of interventions (i.e., casework, group work, and transition support activities) that the youth participants received in the program.

Data analysis

We conducted a Chi-square Test to examine the self-reported pre-post changes of social status of our participants (i.e., in full-time/part-time employment or education, not in employment or education). We also conducted the Paired-Sample T-test to examine their self-reported pre-post

changes in severity of socially withdrawn behaviours and the three secondary outcomes. Missing data were identified in the items measuring socially withdrawn behaviours and the three secondary outcomes. Little's Missing Completely at Random (MCAR) Test was conducted to confirm whether the data were missing completely at random. An independent T-test was conducted to compare the sociodemographic variables (i.e. gender, age, educational attainment, and duration of withdrawal behaviours) between those with/without post-test scores in outcome variables. Using social workers' reported frequencies of sessions of three types of interventions (i.e., casework, group work, and transition support activities) that the youth participants received in the program, multiple regressions were then conducted to examine the associations between the intervention components and the improvement of participants' socially withdrawn behaviours.

Results

As displayed in Table 1, each participant received about 25.8 sessions of individualized casework, 6.4 sessions of group work, and 9.83 sessions of career-transitional support in the program. Among the 175 participants, 169 participants reported both pre- and post-intervention employment/educational status. Table 2 shows the results of Chi-square Test, which supported a significant change of proportions of participants in terms of four types of social status before and after joining the program, X^2 (6, n=169) = 37.03, $p<0.001$, *Cramer's V*= .33). In particular, 75.2% of those participants (n=125) who were not in education or employment before enrolling into the

program have become a full-time employee (n = 36), part-time employee (n = 14), or a student (n = 44) at the end of the program.

<Insert Table 2 about here>

There were 29 pieces of missing data in post-test of the scale. By conducting Little's Missing Completely at Random (MCAR) Test, we confirmed that the data were missing completely at random (X^2=1.55, df =3, p=.67). The results of Independent T-test showed that no significant differences were identified in terms of gender (t=-.24, p=.81), age (t=.62, p=.54), educational attainment (t=-.42, p=.68), and duration of withdrawal behaviours (t=-.51, p=.61) between two groups of participants with/without reporting their post-test scores of socially withdrawn behaviours. Table 3 presents the results of Paired-Sample T-test for the participants whose pre- and post-intervention scores in the withdrawal behaviour scale can be paired up (n=146). The results suggested that post-intervention scores of four items in the scale and the whole scale were significantly lower than the pre-intervention scores, which supported a significant decrease of socially withdrawn behaviours of participants after joining the program. The results also showed that there were statistically significant changes on self-esteem (t=-7.78, p<.001), perceived employability self-efficacy (t=-5.57, p<.001), and social interaction anxiousness (t=2.93, p<.01).

<Insert Table 3 about here>

The results of multiple regressions for examining the efficacies of the interventions are shown in Table 4. Using the number of sessions of young people's participation in the three types of interventions reported by social workers, Model 1-3 showed that group work was significant predictors for explaining the changes of pre- and post-intervention scores in socially withdrawn behaviours after controlling for sociodemographic characteristics of participants (i.e., gender, age, educational attainment, and duration of withdrawal behaviours) separately. Model 4 revealed that group work significantly influenced participants' withdrawal behaviours after controlling for the other two types of interventions. Model 5 suggested that no interaction effects were identified among these types of interventions.

<Insert Table 4 about here>

Discussions

This paper presents the evaluation findings of a multicomponent social service-oriented program characterized by the involvement of MAO, both social workers and trained animals in assisting YPSW to regain their momentum and reengage themselves in the community again. It is acknowledged that some scholars or professionals may see the socially withdrawn way of living as a preferred lifestyle by the young people and should not be seen as a problematic way of living (Chan & Lo, 2014b); however, a prolonged period of self-seclusion at home and avoidance of face-

to-face social contact with people other than family members have been revealed to cause many negative consequences in many different aspects such as physical (i.e., obesity and hypertension), psychological (i.e., self-injury behaviour), and social (i.e., bullying, and marginalization) well-being. All these negative outcomes left unattended would potentially lead to long-term disadvantages with ripple effects in families and the society at large (Kato et al., 2018; Wong, et al., 2020; Yuen et al., 2018). With the involvement of social workers and assisted canines in the intervention, the RM program was designed to assist the YPSW to venture into the community again with enhanced self-esteem and efficacy in terms of participation and/or employability.

The first major finding of the study is that most of the YPSW participants achieved new social status as a full-time or part-time student or employee. By reviewing the harming effects caused by the mainstream culture with reflection or through a reflexive lens, which places an emphasis on the advancement of gross domestic product and the writing up of a resume with paid work experience and educational credentials, the RM program started from where the participants were by involving MAO to support them in their challenging transition to adulthood. By starting to work with these young people in their zone of proximal development, the findings showed the efficacy of this approach to work with YPSW as evidenced by their ability to resume schooling or finding a job, which could echo the findings of some recent studies adopting similar intervention strategies (Su et al., 2021; Su & Wong, 2022).

The second finding of the study is that the socially withdrawn behaviours of the participants have significantly decreased after going through the RM program, although not all of the participants regained a new status as an employee or as a student. In other words, participants spent less of their time confined at home, or less likely to avoid social gathering or social relationship, or feel embarrassed in social interaction, etc. Apart from getting rid of disengaged status and reducing socially withdrawn behaviours, the study suggested that the youth participants experienced positive development after going through the RM program specifically in terms of decreased social interaction anxiousness, enhanced self-esteem, and enhanced perceived self-employability. These findings are consistent with the results of the pilot study implemented between 2010 and 2012 (Wong et al., 2019).

Finally, the study revealed that the influences of MAO on reengaging YPSW are effective particularly in a group work setting. This finding is consistent with prior studies (Nimer & Lundahl, 2007; Perry et al., 2012) which revealed the effects of animal-assisted therapy for at-risk groups who may otherwise remain alone or invisible. The finding of this study also echoed some studies (Su et al., 2021; Wong et al., 2019) which have revealed that YPSW will be more willing to join an intervention program when they are accompanied by nonhuman animals as they feel being welcomed and accepted by these animals. Moreover, the study highlighted the effects of animal-assisted interventions in group-based settings. One possible explanation for this finding is that

YPSW could also peer-support each other in a less competitive and stigmatized environment. Through interactions with other YPSWs, human and nonhuman MAO in the group environment, the youth participants may be able to socialize with others, express their feelings, care for themselves and others, and thus rebuild their self-confidence. After experiencing the group dynamics and collaboration with others in an enabling group atmosphere, the youth participants may also develop teamwork spirit and social skills, and get ready for their work/study. Hence, it is not surprising to find that the group work component significantly decreased participants' withdrawal behaviours after controlling for the impact of individualized casework and career-related transition interventions.

Limitations

There are some limitations of this study that should be addressed. First of all, the sample size is small and no control group is involved in this study. It is noteworthy that YPSW are extremely hard to be reached and many efforts have been made to involve the youth participants for this study. These young people have strong intention to stay away from strangers and opt to be invisible in society (Li & Wong, 2015b). During and after the COVID-19 pandemic, many young people will confront dramatically altered goals and aspirations, and marginalized young people like YPSW are more vulnerable to the impacts caused by precarious employment and economic recession (Wong, 2020). The findings of the study will inform the design of and research on

interventions targeted at young people showing socially withdrawn behaviours in different cultural backgrounds. Second, there is no follow-up research design conducted to test the longer-term effect of the program, which may lead to a concern about the sustainability of the intervention effects. During the exercise of stringent health measures during the pandemic of COVID-19, social workers may opt to keep contact with and provide support to these youth participants by using different online platforms such as Zoom and they can involve nonhuman animals in such online interactions as well (see Chan & Lo, 2014c). It is suggested to conduct future research studies to test the effectiveness of this type of follow-up interventions.

Conclusion

The RM program has provided an alternative model by emphasizing the involvement of human and nonhuman MAO for reengaging young people with prolonged social withdrawal behaviours who are usually difficult to identify, engage, and retain for services. There were correlations between the interventions in the program and the post-intervention improvement with their social status, withdrawal behaviours, self-esteem, social interaction anxiety, and employment efficacy. Future intervention studies are needed with a more rigorous research design such as involvement of comparison groups and follow-up studies.

References

Barad, K. (2012). On touching—The inhuman that therefore I am. *Differences*, *23*(3), 206-223. http://doi.org/10.1215/10407391-1892943

Chan, G. H. Y., & Lo, T. W. (2014a). Hidden youth services: What Hong Kong can learn from Japan. *Children and Youth Services Review*, *42*, 118-126. http://doi.org/10.1016/j.childyouth.2014.03.021

Chan, G. H. Y., & Lo, T. W. (2016). Family relationships and the self-esteem of hidden youth: A power dynamics perspective. *Journal of Family Issues, 37*(9), 1244-1266. http://doi.org/10.1177/0192513x14537479

Chan, H. Y., & Lo, T. W. (2014b). Quality of life of the hidden youth in Hong Kong. *Applied Research in Quality of Life, 9*(4), 951-969. http://doi.org/10.1007/s11482-013-9279-x

Chan, G. H. Y., & Lo, T. W. (2014c). Do friendship and intimacy in virtual communications exist? An investigation of online friendship and intimacy in the context of hidden youth in Hong Kong. *Revista de Cercetare si Interventie Sociala*, *47*(1), 117-136.

Coe, J. B., Adams, C. L., & Bonnett, B. N. (2009). Prevalence and nature of cost discussions during clinical appointments in companion animal practice. *Journal of the American Veterinary Medical Association*, *234*(11), 1418-1424. https://doi.org/10.2460/javma.234.11.1418

Cruz, J., Goff, M. H., & Marsh, J. P. (2020). Building the mentoring relationship: humanism and the importance of storytelling between mentor and mentee. *Mentoring and Tutoring: Partnership in Learning*, *28*(2), 104-125. http://doi.org/10.1080/13611267.2020.1749344

Daniels, J., D'Andrea, M., & Gaughen, K. J. S. (1998). Testing the validity and reliability of the Perceived Employability Scale (PES) among a culturally diverse population. *Journal of Employment Counseling*, *35*(3), 114-123. http://doi.org/10.1002/j.2161-1920.1998.tb00993.x

Dimolareva, M., & Dunn, T. J. (2020). Animal-Assisted interventions for school-aged children with autism spectrum disorder: a meta-analysis. *Journal of Autism and Developmental Disorders*, 1-14. http://doi.org/10.1007/s10803-020-04715-w

Hayakawa, K., Kato, T. A., Watabe, M., Teo, A. R., Horikawa, H., Kuwano, N., Shimokawa. N., Sato-Kasai, M., Kubo, H., Ohgidani, M., Sagata, N., Toda, H., Tateno, M., Shinfuku, N., Kishimoto, J., & Kanba, S. (2018). Blood biomarkers of Hikikomori, a severe social withdrawal syndrome. *Scientific Reports, 8*(1), 2884. http://doi.org/10.1038/s41598-018-21260-w

Ismail, R. (2020). New starts at New Start: Recovery and the work of hikikomori. *Transcult Psychiatry, 57*(5), 698-709. http://doi.org/10.1177/1363461520958337

Kato, T. A., Kanba, S., & Teo, A. R. (2018). Hikikomori: Experience in Japan and international

relevance. *World Psychiatry, 17*(1), 105-106. http://doi.org/10.1002/wps.20497

Koyama, A., Miyake, Y., Kawakami, N., Tsuchiya, M., Tachimori, H., Takeshima, T., & World Mental Health Japan Survey, G. (2010). Lifetime prevalence, psychiatric comorbidity and demographic correlates of "hikikomori" in a community population in Japan. *Psychiatry Research, 176*(1), 69-74. http://doi.org/10.1016/j.psychres.2008.10.019

Krieg, A., & Dickie, J. R. (2013). Attachment and hikikomori: a psychosocial developmental model. *International Journal of Social Psychiatry, 59*(1), 61-72. http://doi.org/10.1177/0020764011423182

Kruger, K. A., & Serpell, J. A. (2010). Animal-assisted interventions in mental health: Definitions and theoretical foundations. In *Handbook on animal-assisted therapy* (pp. 33-48). Academic Press. https://doi.org/10.1016/B978-0-12-381453-1.10003-0

Lee, Y. S., Lee, J. Y., Choi, T. Y., & Choi, J. T. (2013). Home visitation programme for detecting, evaluating and treating socially withdrawn youth in Korea. *Psychiatry and Clinical Neurosciences, 67*(4), 193-202. http://doi.org/10.1111/pcn.12043

Li, T. M. H., & Wong, P. W. C. (2015a). Youth social withdrawal behavior (hikikomori): A systematic review of qualitative and quantitative studies. *Australian and New Zealand Journal of Psychiatry, 49*(7), 595-609. http://doi.org/10.1177/0004867415581179

Li, T. M. H., & Wong, P. W. C. (2015b). Editorial Perspective: Pathological social withdrawal

during adolescence: a culture-specific or a global phenomenon? *Journal of Child Psychology and Psychiatry, 56*(10), 1039-1041. http://doi.org/10.1111/jcpp.12440

Matuszek, S. (2010). Animal-facilitated therapy in various patient populations: Systematic literature review. *Holistic nursing practice*, *24*(4), 187-203. http://doi.org/10.1097/HNP.0b013e3181e90197

Nimer, J., & Lundahl, B. (2007). Animal-assisted therapy: A meta-analysis. *Anthrozoös*, *20*(3), 225-238. http://doi.org/10.2752/089279307X224773

Nishida, M., Kikuchi, S., Fukuda, K., & Kato, S. (2016). Jogging therapy for hikikomori social withdrawal and increased cerebral hemodynamics: a case report. *Clinical Practice and Epidemiology in Mental Health: CP & EMH, 12*, 38. http://doi.org/10.2174/1745017901612010038

Perry, D., Rubinstein, D., & Austin, J. (2012). Animal-assisted group therapy in mental health settings: An initial model. *Alternative and Complementary Therapies*, *18*(4), 181-185. http://doi.org/10.1089/act.2012.18403

Pozza, A., Coluccia, A., Kato, T., Gaetani, M., & Ferretti, F. (2019). The 'Hikikomori' syndrome: worldwide prevalence and co-occurring major psychiatric disorders: a systematic review and meta-analysis protocol. *BMJ Open, 9*(9), e025213. http://doi.org/10.1136/bmjopen-2018-025213

Rooksby, M., Furuhashi, T., & McLeod, H. J. (2020). Hikikomori: a hidden mental health need following the COVID-19 pandemic. *World Psychiatry, 19*(3), 399-400. http://doi.org/10.1002/wps.20804

Saito, T., & Angles, J. (2013). *Hikikomori: Adolescence without end*. University of Minnesota Press.

Simonato, M., De Santis, M., Contalbrigo, L., De Mori, B., Ravarotto, L., & Farina, L. (2020). The Three Rs as a Framework for Considering the Ethics of Animal Assisted Interventions. *Society & Animals*, *1*(aop), 1-25. http://doi.org/10.1163/15685306-00001767

Su, X., Li, T. M., & Wong, P. W. (2021). Expanding sources of recognition: Towards an experience-driven framework for reengaging hikikomori and semi-hikikomori. *Child and Adolescent Social Work Journal*, 1-13. https://link.springer.com/article/10.1007/s10560-021-00795-4

Su, X., & Wong, V. (2022). Enhancing the career capabilities of NEET youth in Hong Kong: an experience-driven framework. *International Journal for Educational and Vocational Guidance*, 1-26. https://link.springer.com/article/10.1007/s10775-022-09531-5

Su, X., Wong, V., & To, S. M. (2020a). Factor structure of the Chinese Career Adapt-Abilities Scale in youth with a longer spell of status of not in education, employment, or

training. *Child & Youth Services*, 1-18. http://doi.org/10.1080/0145935X.2020.1768843

Su, X., Wong, V., & To, S. M. (2020b). Amotivation, career engagement, and the moderating role of career adaptability of youth not in education, employment, or training. *Asia Pacific Career Development Journal*, *3*(2):1-18. https://asiapacificcda.org/resources/APCDJ/A0003_2_01.pdf

Tateno, M., Teo, A. R., Ukai, W., Kanazawa, J., Katsuki, R., Kubo, H., & Kato, T. A. (2019). Internet Addiction, Smartphone Addiction, and Hikikomori Trait in Japanese Young Adult: Social Isolation and Social Network. *Frontier in Psychiatry, 10*, 455. http://doi.org/10.3389/fpsyt.2019.00455

Teo, A. R., Nelson, S., Strange, W., Kubo, H., Katsuki, R., Kurahara, K., Kanba, S., & Kato, T. A. (2020). Social withdrawal in major depressive disorder: a case-control study of hikikomori in japan. *Journal of Affective Disorders, 274*, 1142-1146. http://doi.org/10.1016/j.jad.2020.06.011

Toivonen, T., Norasakkunkit, V., & Uchida, Y. (2011). Unable to conform, unwilling to rebel? Youth, culture, and motivation in globalising Japan. *Frontier in Psychology, 2*, 207. http://doi.org/10.3389/fpsyg.2011.00207

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.

Wong, J. C. M., Wan, M. J. S., Kroneman, L., Kato, T. A., Lo, T. W., Wong, P. W., & Chan, G. H. (2019). Hikikomori Phenomenon in East Asia: Regional Perspectives, Challenges, and Opportunities for Social Health Agencies. *Front Psychiatry, 10*, 512. http://doi.org/10.3389/fpsyt.2019.00512

Wong, P. W. C. (2020). Potential changes to the hikikimori phenomenon in the wake of the Covid-19 pandemic. *Asian Journal of Psychiatry, 54*, 102288. http://doi.org/10.1016/j.ajp.2020.102288

Wong, P. W. C., Li, T. M. H., Chan, M., Law, Y. W., Chau, M., Cheng, C., Fu, K.W. , Bacon-Shone, J., & Yip, P. S. F. (2015). The prevalence and correlates of severe social withdrawal (hikikomori) in Hong Kong: A cross-sectional telephone-based survey study. *International Journal of Social Psychiatry, 61*(4), 330-342. http://doi.org/10.1177/0020764014543711

Wong, P. W. C., Yu, R. W. M., Li, T. M. H., Lai, S. L. H., Ng, H. Y. H., & Fan, W. T. W. (2019). Efficacy of a Multicomponent Intervention with Animal-Assisted Therapy for Socially Withdrawn Youth in Hong Kong. *Society & Animals, 27*(5-6), 614-627. http://doi.org/10.1163/15685306-12341462

Wong, V. (2009). Youth locked in time and space? Defining features of social withdrawal and practice implications. *Journal of Social Work Practice*, *23*(3): 337–352.

http://doi.org/10.1080/02650530903102692

Wong, V. (2012). Social withdrawal as invisible youth disengagement: Government inactioni and NGO responses in Hong Kong. *International Journal of Sociology and Social Policy*, *30*(7/8), 415-430. http://doi.org/10.1108/01443331211249057

Wong, V. (2014). Social work with youth in social withdrawal: In home and beyond-home intervention modalities. *China Journal of Social Work*, *7*(2), 161–174. https://doi.org/10.1080/17525098.2014.921211

Wu, A. F., Catmur, C., Wong, P. W., & Lau, J. Y. (2020). The presence, characteristics and correlates of pathological social withdrawal in Taiwan: An online survey. *International Journal of Social Psychiatry, 66*(1), 84-92. http://doi.org/10.1177/0020764019882724

Yuen, J. W. M., Yan, Y. K. Y., Wong, V. C. W., Tam, W. W. S., So, K. W., & Chien, W. T. (2018). A physical health profile of youths living with a “hikikomori” lifestyle. *International Journal of Environmental Research and Public Health, 15*(2). http://doi.org/10.3390/ijerph15020315

Table1 Descriptive information of participants (N = 175)

	YPSW	
	N	***%***
Gender		
Female	63	36.0
Male	112	64.0
Age		
<15	39	22.3
15-19	76	43.4
20-24	38	21.7
25 or above	22	12.6
Edu. attainment		
Secondary 3 or below	100	57.1
Secondary 4 – Secondary 6	55	31.4
Post-secondary or above	20	11.4
Living arrangement (missing data*)		
living alone	2	1.1
living with someone including parents	156	89.1
living with someone but not parents	9	5.1
Duration of withdrawal behaviours		
0-3 months	26	14.9
3-6 months	18	10.3
6 -12 months	20	11.4
12-24 months	48	27.4
24-36 months	19	10.9
>36 months	44	25.1
Diagnosis of mental health disorder		
Yes	41	23.4
No	134	76.6
Exp. of having a pet		
Yes	125	71.4
No	50	28.6
	Mean	***SD***
Reported sessions of participation in interventions		
Case work (with/without AAT)	25.81	17.15
Group work (with/without AAT group work plus gathering with dogs)	6.43	11.36
Career-transitional support activities (pet grooming, job placement)	9.83	18.15

Table 2 Comparison of pre- and post-intervention status of participants (N =169)

	Post-intervention status					
	Not in education, employment, or training (n = 38)	In education (n = 78)	In part-time employment (n =16)	In full-time employment (n = 37)	Pearson Chi-Square	Cramer's V
Pre-intervention status (n, % within all participants)	N (% within pre-intervention status)				X^2 (6, n = 169) = 37.034***	.331***
Not in education, employment, or training (n= 125, 75.2%)	31 (24.8%)	44 (35.2%)	14 (11.2%)	36 (28.8%)		
In part-time employment (n =7, 4%)	4 (57.1%)	2 (28.6%)	1 (14.3%)	0 (0)		
In full-time employment (n = 37, 21.14%)	3 (8.1%)	32 (86.5%)	1 (2.7%)	1 (2.7%)		

Note. *$p<.05$; **$P<.01$; ***$p<.001$

Table 3. Paired-sample T-test for the change of pre- and post-withdrawn behaviours

	Pre-intervention *Mean* (*SD*)	Post-intervention *Mean* (*SD*)	*t*	*95% CI (lower, upper)*
Withdrawn behaviours [a] (*N* =146)	3.16 (0.69)	2.51 (0.72)	9.24***	0.52, 0.80
Item 1 - Stay home all day long (*N*=146)	3.93 (.98)	2.70 (1.19)	10.469***	.99, 1.46
Item 2 - Avoid social interaction (*N*=146)	2.84 (1.13)	2.33 (.97)	5.008***	.31, .71
Item 3 - Leave my room for school/work (*N*=146)	2.67 (1.06)	2.18 (.96)	4.942***	.30, .70
Item 4 - Not feeling embarrassed for social interaction (*N*=146)	3.20 (1.04)	2.82 (.92)	3.854***	.18, -.57
Self-esteem [b] (*N*=174)	24.40 (4.67)	27.18 (4.44)	-7.78***	-3.49, -2.08
Social interaction anxiousness [c] (N = 171)	48.44(10.14)	46.35 (8.97)	2.93**	.68, 3.49
Perceived employability self-efficacy [d] (N = 173)	45.95 (9.66)	49.86 (8.71)	-5.57***	-5.28, -2.52

Note. **p<.05; **P<.01; ***p<.001*

a. An average of four items for measuring socially withdrawn behaviours

b. Measured by the Rosenberg Self-Esteem Scale (RSES): 10-40

c. Measured by the Interaction Anxiousness Scale (IAS):15-75

d. Measured by the Perceived Employability Self-Efficacy Scale (PESES): 15-75

Table 4. Regressions for analyzing the associations of the intervention components on the improvement of participants' socially withdrawn behaviours ($N = 146$)

	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	.07	.08	.09	.07	.07
Age	.11	.06	.03	.09	.09
Educational attainment	-.03	-.04	.01	-.04	-.05
Duration of withdrawal behaviours	.02	.03	.03	.00	.01
Case work	.18*			.09	.09
Group work		.28**		.26**	.01
Transitional support activities			.17	-.01	.05
Casework* group work					-.12
Group work* transitional support					.18
Case work*transitional support					.12
Adjusted R^2	0.02	0.07	0.02	0.06	0.05
F change	1.53	3.05*	1.38	2.36*	1.71

Note. **p<.05; **P<.01; ***p<.001*

Figure 1. Flowchart of the RM Program