Co-living with migrant domestic workers is associated with a lower level of loneliness among community-dwelling older adults: A cross-sectional study

Abstract

Loneliness (inclusive social loneliness and emotional loneliness) of older adults is a prominent public health issue internationally. Factors consistently associated with loneliness are age, gender, education, living arrangements, social network, and functional status. Intergenerational co-living with spouse and adult children is important for the exchange of social, emotional, practical, and financial support provided to older adults. Co-living with migrant domestic workers (MDWs) to care for older adults became an emergent phenomenon internationally, particularly in Asian countries. According to the convoy model of social relations, the effect of co-living with MDWs on older adults' loneliness is unknown. This study examined (1) the prevalence of loneliness among community-dwelling older adults; and (2) the association between co-living with MDWs and older adult loneliness. Using the Chinese version of the 6-item De Jong Gierveld Loneliness Scale on loneliness, 380 older adults were interviewed at busy points in Hong Kong, including subway stations. 35.3% of older adults experienced moderate-to-severe loneliness. Linear regression was performed to examine the association between co-living with MDWs and loneliness. The results showed that co-living with MDWs was significantly associated with lower levels of overall loneliness (β=-0.636; p=0.022) and emotional loneliness (β=-0.298, p=0.039), but not for social loneliness (β=-0.337, p=0.084). While MDWs could be an attachment figure for older adults, they might not be effective in promoting social integration of older adults. There is a need to investigate the barriers of social integration faced by older adults co-living with MDWs.

What is known about this topic

- Older adult loneliness is a prominent public health threat;

- Older adults co-living with migrant domestic workers are increasingly popular internationally, particularly for Asian countries and cities;

- The effect of co-living with migrant domestic workers on older adult loneliness is uncertain.

What this paper adds

- Co-living with migrant domestic workers is associated with lower levels of overall loneliness and emotional loneliness;

- Co-living with migrant domestic workers is not associated with social loneliness;

- Further investigation on barriers of social integration faced by older adults co-living with MDWs is needed.

Introduction

Loneliness has been conceptualized as a highly subjective experience of deficit between actual and desired levels of social contact (De Jong Gierveld, van Tiburg, & Dykstra, 2018). In considering the experience of loneliness, Weiss (1973) made a distinction between social loneliness and emotional loneliness. 'Social loneliness' refers to the absence of valued social networks, such as losing social contact with peers after retirement, impeding one's own social integration (De Jong Gierveld et al., 2018; Weiss, 1973). 'Emotional loneliness' refers to the absence of an intimate figure to attach, such as following the death of a spouse, experiencing deficit in attachment (De Jong Gierveld et al., 2018; Weiss, 1973). Factors consistently associated with loneliness include age, gender, education, living arrangements, social network, and functional status (Aartsen & Jylhä, 2011; De Jong Gierveld et al., 2018; Jylhä, 2004; Yang & Victor, 2008) and is estimated to affect 26% - 42% of community-dwelling older adults in European nations and China (CUHK Jockey Club Institute of Ageing, 2017; Fokkema, De Jong Gierveld, & Dykstra, 2012; Yang & Victor, 2011). Loneliness was found to be associated with many health outcomes in older adults, such as mortality risk (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015), cognitive decline (Shankar, Hamer, McMunn, & Steptoe, 2013), and depression (Park, Jang, Lee, & Chiriboga, 2017).

Living alone presents obstacles to experience social integration, contributing to loneliness (Hawkley, et al., 2008). Intergenerational co-living with family members (spouse or adult children), as a vehicle for the exchange of social, emotional, practical and financial support, was shown to be an important factor protecting against older adult loneliness (Chen, Hicks, & While, 2014; De Jong Gierveld, Dykstra, & Schenk, 2012; Dykstra & De Jong Gierveld, 2004; Pinquart, 2003). Due to an increase in longevity and a shortage of family caregivers, hiring migrant domestic workers (MDWs) was shown to be effective in relieving

family caregiving burden for older adults (Chong, Kwan, Chi, Lou, & Leung, 2014). Therefore, co-living with MDWs has become an emerging international phenomenon for older adults in recent decades (Ho, Chiang, Leung, & Cheung, 2019; Kay, 2017; Lutz, 2008). A MDW is a full-time live-in migrant worker who is tied to an employer either through a regulated work permit or underground contract that allows the MDW to work for a single household (Basnyat & Chang, 2017). Among the 11.5 million MDWs worldwide, 52% are shared by the Arab states, North America, northern, southern and western Europe (Gallotti, 2015). Asian countries or cities demonstrate great demand of MDWs for older adult care. Approximately 183,000 Hong Kong older adults are being cared for by MDWs (Mission for Migrant Workers, 2018). Singapore will need 300,000 MDWs for older adult care by 2030 (National Population and Talent Division, 2012). 12.8% of Taiwan frail older adults are cared by MDWs (Chou, Kröger, & Pu, 2015), and 17.4% of Israeli older adults received government subsidy to hire MDWs (Ayalon & Roziner, 2016). Internationally, MDWs generally perform both caring work and domestic work, known as the three Cs: cooking, cleaning, and caring (Anderson, 2000). However, the boundaries between domestic work and care work are usually blurred (Ayalon, Shiovitz-Ezra, & Palgi, 2012). Despite the growing trend of older adults co-living with MDWs, information about the effect of MDWs on older adult loneliness is scant.

The convoy model of social relations posits that the people around an individual are part of a dynamic network – a convoy – that includes people who support and are supported by that individual and are exerting effects on the individual's wellbeing (Antonucci, 2001). In light of this, MDWs may be able to alleviate the social loneliness of older adults, particularly for dependent older adults. Dependent older adults are at risk of decreasing social integration, especially when family members are away from home during the workday (Yeoh & Huang, 2009). MDWs usually provide round-the-clock services (Mission for Migrant Workers,

2018). Therefore, MDWs may be a consistent source of social contact with older adults, particularly for those who are functionally dependent on the availability of MDWs (Yeoh & Huang, 2009). Generally, MDWs have been known to support older adults in maintaining their social network, such as by assisting them in joining family dinners or church activities (Ho et al., 2019; Walsh and Shutes, 2013). Therefore, we posit that older adults living with MDWs will experience lower level of social loneliness.

Besides the availability of social contact from MDWs, the relationships between MDWs and older adults are constantly negotiatied that older adults would eventually became more dependent, both instrumentally and psychologically, on the MDWs (Baldassar, Ferrero, & Portis, 2017), and portraying MDWs as friendly or even as fictive-kin (Ho, Chiang, Leung, & Ku, 2018; Karner, 1998). This sheds light to MDW's potential to alleviate emotional loneliness of older adults. According to the convoy model, the people closest to the individual in the convoy are the most important providers of support, and may be irreplaceable because the solid emotional exchange that they provide is a key attribute of social support (Antonucci, 2001). Recent studies have shown that MDWs provide important emotional support to older adults, with the dyad of MDW and older adult developing a very close relationship, referred to as the kinning process (Ho et al., 2018; Ho et al., 2019). There was a case that a dying older adult requested the company of a MDW instead of her daughter (Ho et al., 2018). Although employer-employee power hierarchy is a dominant feature within the dyad, MDWs employed emotional labour to demonstrate their good stewardship to older adults, tactically avoiding conflicts with older adults (Ho et al., 2019). While family constitutes the major source of emotional support protecting against loneliness in old age (Chen et al., 2014), modern family structure might not facilitate it. For example, the average household size was 2.8 in Hong Kong (Census and Statistics Department, 2020), which contradicts the traditional Chinese value of family orientation in Hong Kong (Chan & Chui, 2011). In light of the

convoy model, MDWs may be an intimate figure for older adults to attach in a modern society.

Given that both 'social loneliness' and 'emotional loneliness' contribute to an individual's overall perception of loneliness (De Jong Gierveld et al., 2018; Weiss, 1973), we posit that older adults living with MDWs will experience lower levels of loneliness. While family solidarity, particularly support from spouse and adult children, has long been a dominant focus in studies of older adult loneliness (De Jong Gierveld et al., 2018), the emerging co-living phenomenon of MDWs presents a pressing need to examine its unknown impact on older adult loneliness (Ayalon et al., 2012).

Objectives

The objectives of the study are:

1. To identify the prevalence of loneliness of community-dwelling older adults; and
2. To examine the association between co-living with MDWs and loneliness of community-dwelling older adults.

Methods

Study Design

This was an observational study employing a cross-sectional design. We, therefore, report this study in the format recommended in the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (von Elm et al., 2007).

Setting

This study was conducted in the community. Participants were all community-dwelling Hong Kong citizens.

Participants

Hong Kong comprises 18 districts by geographical locations as divided by the government. The socioeconomic status and housing condition of the citizens and population in different districts vary (Census and Statistics Department, 2018). These factors are associated with the level of loneliness (Chen et al., 2014; De Jong Gierveld et al., 2012; Dykstra & De Jong Gierveld, 1999). In order to ensure that the sample of the study could represent the population, this study adopted quota sampling to ensure that there was an adequate number of samples in each stratum (i.e., a district in Hong Kong). The quota assigned to each stratum was based on the population proportion in the district. For example, there were 64,473 older adults (i.e., 5.5% of the Hong Kong population) living in the district of Sham Shui Po, in which the sample quota was set as 5.5% (Census and Statistics Department, 2018).

The trained research assistants approached the potential participants at the busy point of the city including subway exits and train stations. We notice that the patronage could varies around the clock. Therefore, the data collection was conducted on weekdays from 9 am to 7 pm from July to November 2019, which was shown to be effective to include a good mix of participants with different socio-demographics (Lam, Chan, Chong, Wong, & Ye, 2018; Liu, Lam, Chung, & Ho, 2020). Potential participants were invited to attend for eligibility screenings according to the eligibility criteria below.

Inclusion criteria

1. Aged 60 years or above, and

2. Community-dwelling, which was defined as living at home without being institutionalized in the past six months.

Exclusion criteria

1. Cognitive impairment, as defined by Abbreviated Mental Test (AMT) score lower than 7 (Lam, Wong, & Woo, 2010) because cognitive impairment is associated with poorer recall which may lead to recall bias (Tsoi et al., 2017).

Variables and measurement

Data were collected by a trained research assistant using Cantonese face-to-face interviews guided by questionnaires. So far, no concerns on the literacy and it was not a factor of eligibility. The research assistant was trained to achieve at least 90 per cent inter-rater reliability with the second author. Periodical on-the-spot checking was conducted by the first author. Regular research team meetings were held to clear any difficulties related to data collection. All interviews were conducted at quiet places on the street, such as corners in a station, to provide a relatively isolated area with minimum distraction. Each interview took approximately 30 minutes to complete. Upon completing the interview, each participating older adult was given a HK$20 (approximately US$2.6) beverage coupon to compensate them for their time. In order to avoid interviewing the same older adult more than once, each older adult was asked to indicate whether this was his/her first time to be interviewed for this project.

Outcome

Loneliness was measured using the Chinese version of the 6-item De Jong Gierveld Loneliness Scale (DJGLS) (Leung, de Jong Gierveld, & Lam, 2008). The scale consists of three items that measure emotional loneliness and three other items on social loneliness. Each item was rated by a 3-point scale (0=no, 1=more or less, 2=yes). The total score ranged from 0 to 6. A higher score indicates a greater level of loneliness. The internal consistency of the scale (Cronbach's $\alpha = 0.76$) was good, and the inter-rater reliability (Intraclass correlation

coefficient, ICC = 0.98 – 1.00) was excellent in the Hong Kong Chinese population (Leung et al., 2008).

Predictor

Living with MDWs was measured by asking the participants a dichotomous question: "Do you live with one or more MDW(s)?" (1=yes, 0=no).

Potential confounders

From a life course perspective, ageing *per se* predisposes conditions for feeling lonely because of adversities happening naturally across an individual's life, such as personal loss (e.g. retirement), declining health (e.g. chronic illnesses) and disabilities (e.g. physical impairment) (Stephens, Breheny, & Mansvelt, 2015). Potential confounders were categorized into socio-demographic, clinical, and co-living variables. Factors consistently associated with loneliness include age, gender, marital status, education, living arrangements, social network, and functional status (Chen et al., 2014; De Jong Gierveld et al., 2012; 2018).

Socio-demographic variables consisted of age (in years), sex (1=male, 2=female), marital status (1=single, 2=married, 3=divorced/separated/widowed), employment (1=retired/unemployed, 2=part-time/temporary, 3=full time), education level (1=nil/pre-primary, 2=primary, 3=secondary), and social network.

Social network was measured using the Chinese version of the 10-item Lubben Social Network Scale (LSNS). LSNS measures social network support from family, friends, and interdependent relations. Some of the responses included information on the number of family or friend networks that people had, and the frequency with which they had contact with people in those networks. Each item could be rated by a 6-point scale by frequency (e.g., 0=never, 5=always). The total score ranged from 0 to 50. A higher score indicates having a

better social network. The internal consistency of the scale was found to be satisfactory, as indicated by a Cronbach's alpha of 0.72 (Chou & Chi, 1999).

Clinical variables consisted of number of chronic illnesses, cognitive function, and functional capacity. Number of chronic illness were measured by questions asking the participants if a doctor had ever told the participants that they had the chronic illnesses: hypertension, heart diseases, Parkinson's disease, diabetes mellitus, osteoporosis, asthma, hyperlipidemia, arthritis, cancer, depression, and others specified by the participants.

Cognitive function was measured using Abbreviated Mental Test (AMT) Hong Kong version (Lam et al., 2010). AMT comprises 10 dichotomous items. One point is assigned for a correct answer. The total score of AMT ranges from 0 to 10 points. A higher score indicates better cognitive function. AMT Hong Kong version was validated showing good internal consistency (Cronbach's α = 0.81), stability (r=0.993), concurrent (r=0.86) and criterion validities (sens=0.92, spec=0.87) to identify cognitive impairment compared with Mini-Mental State Exam (MMSE) (Lam et al., 2010).

Functional capacity was measured using Lawton's Instrumental Activities of Daily Living (IADL) scale Hong Kong Chinese version (Tong & Man, 2002). IADL consists of nine items representing nine types of instrumental activities of daily living. Each item could be rated by a 3-point ordinal scale (2="independent", 1="with help", 0="unable to do"). The total score of IADL ranges from 0 to 18. A higher score indicates a more independent performance on instrumental daily activities. The IADL Hong Kong Chinese version was validated showing good inter-rater (ICC=0.99) and test-retest (ICC=0.90) reliabilities, as well as good internal consistency (Cronbach's α=0.86) (Tong & Man, 2002).

Co-living variables consisted of living alone (1=yes, 2=no), living with spouse (1=yes, 2=no), and living with children (1=yes, 2=no).

Bias

To minimize the potential selection bias inherited in convenient sampling, the trained research assistant collected data from multiple sites by adopting quota sampling according to the percentage of older adults in the 18 Hong Kong political districts with long hours of data collection from 9am to 7pm, which is a common practice for collecting community sample in Hong Kong (Lam, Chan, Chong, Wong, & Ye, 2018; Liu, Lam, Chung, & Ho, 2020).

Sample size

Sample size was estimated according to the two objectives of this study. For objective #1, Cochran's Formula ($N=pq/(E/1.96)^2$) was used to calculate number of samples needed to estimate the prevalence of loneliness (Vaughan & Morrow, 1989). According to the formula, p is the maximum expected prevalence of older people loneliness, where q is 100-p; and E is the margin of the sampling error that is tolerated (generally not greater than 5% in population-based studies, to obtain a confidence level of 95%) (Vaughan & Morrow, 1989). According to the CUHK Jockey Club Institute of Ageing (2017), 41.4 per cent of Hong Kong older adults suffer from loneliness. Therefore, the size of our sample should be at least 373.

For objective #2, priori power analysis using linear multiple regression (fixed model, single regression coefficient) statistical test through G*Power was employed (Faul, Erdfelder, Lang, & Buchner, 2007). In the literature, no studies reported the association between co-living status with MDWs with loneliness in older people. A similar study showed that loneliness is associated with co-living status (i.e., living alone or living with family) at a medium strength (i.e., d=0.46) (O'Súilleabháin, Gallagher, & Steptoe, 2019). Assuming a similar medium effect size (i.e., $f^2=0.15$), error probability to be 0.05, power to be 0.8, number of tested predictors to be 1 using loneliness scale score as the dependent variable, and total number of predictors to be 13, the sample size is estimated to be at least 55. In order to

recruit adequate amount of sample test achieve both objectives, this study planned to recruit 373 participants.

Statistical methods

Data were analysed using the SPSS statistical software version 23. Outcome, predictor, and potential confounder variables were described by using mean with standard deviation and frequency with percentage according to the level of measure of the variables. For objective #1, the prevalence of loneliness was described by levels of severity (i.e., "moderately lonely" and "severely lonely") by percentage with 95% confidence intervals. For objective #2, the association of loneliness and living with MDWs was tested by general linear models. The dependent variable was loneliness and the independent variable was living with MDWs. Potential confounding variables included age, sex, level of education, marital status, employment, living alone, living with spouse, living with children, cognitive function, number of chronic illnesses, functional capacity, and social network (Chen et al., 2014; Dykstra, Van Tilburg & de Jong Gierveld, 2005; De Jong Gierveld et al., 2012). Therefore, these factors were adjusted in the general linear model. Sensitivity analysis was conducted to compare the results between adjusted and unadjusted models. Listwise exclusion of missing values was adopted in the analysis. Level of significance was set at 0.05.

Ethical Considerations

Ethical approval was sought from the School Research Committee of a local tertiary education institution. Informed verbal consent was obtained from the participants after they were provided with the relevant information, including information on the purpose of the study, their right to participate in or withdraw from the study, and the measures being taken to ensure confidentiality. For those who were screened to have possible cognitive impairment

(i.e., AM < 7) (Lam et al., 2010), we provided information on geriatric clinics for a follow-up check, which was a usual practice in Hong Kong.

Results

The research assistant approached 403 older adults and screened out 23 older adults with AMT score lower than 7. Since the data collection was conducted face-to-face by the research assistant, there were only two missing data on the education level of participants. Eventually, 380 eligible participants entered the analysis.

As shown in Table 1, the mean age of the participants was 70.8 years (SD=7.5). The majority of them were female (n=195, 51.3%), married (n=286, 75.4%), retired or unemployed (n=295, 77.6%), and attained secondary education (n=220, 57.9%). The mean LSNS score was 26.5 (SD=6.8). The participants had a mean number of chronic illnesses of 0.9 (SD=1.2), a mean AMT score of 9.6 (SD=0.8), and a mean IADL of 17.4 (SD=1.1). Most of the participants did not live alone (n=324, 85.3%), lived with spouse (n=280, 73.7%), and lived with children (n=268, 70.5%). The mean DJGLS was 2.0 (SD=1.9). The majority of the participants did not live with MDWs (n=332, 87.4%), which is similar to other local studies (Mission for Migrant Workers, 2018; Wong & Yeung, 2019).

For the objective #1, as shown in Table 1, the prevalence of loneliness at moderate level was 18.7% (95% CI=0.15 – 0.23), while the prevalence of loneliness at severe level was 16.6% (95% CI=0.13 - 0.21).

For the objective #2, as shown in Table 2, in the unadjusted model, living with MDWs was significantly associated with a lower level of loneliness (β=-0.793, p=0.008). In adjusted model, after adjusted with the potential confounders, living with MDWs was also significantly associated with a lower level of loneliness (β=-0.636, p=0.022). For the potential confounders, participants having no formal education (β=1.560, p=0.001) and

attained primary education level (β=0.849, p=0.012) were associated with a higher level of loneliness compared with those having a higher education level (i.e., attained tertiary education). A higher level of social network (β=-0.077, p<0.001) was associated with a lower level of loneliness. A higher level of cognitive function (β=-0.412, p=0.004) was associated with a lower level of loneliness. A higher level of functional capacity (β=-0.220, p=0.027) was associated with a lower level of loneliness. Other potential confounders including age, sex, marital status, employment status, living alone, living with spouse, and living with children were not observed to be associated with loneliness. We further investigated the associations of living with MDWs with emotional loneliness (Table 3) and social loneliness (Table 4) with the same regression model. After adjusted with potential confounders, living with MDWs was also significantly associated with a lower level of emotional loneliness (β=-0.298, p=0.039) but not for social loneliness (β=-0.037, p=0.084). All the confounders significantly associated with overall loneliness were also significantly associated with emotional loneliness, except cognitive function. Being male was associated with a lower level of emotional loneliness (β=-0.201, p=0.040). Confounders significantly associated with social loneliness included no formal education (β=0.721, p=0.024), cognitive function (β=-0.303, p=0.003) and social network (β=-0.061, p=<0.001).

Discussion

In line with other studies, low or without education, lower cognitive function, lower level of functional capacity, and poorer social network are associated with greater level of loneliness among older adults (Chen et al., 2014; De Jong Gierveld et al., 2018; Dykstra et al., 2005; Dykstra & De Jong Gierveld, 1999; Yang & Victor, 2008). There were 35.3% of older adults experiencing moderate to severe loneliness, which was similar to other studies internationally (CUHK Jockey Club Institute of Ageing, 2017; Fokkema, De Jong Gierveld & Dykstra, 2012; Yang & Victor, 2011). However, 16.6% of older adults experienced severe

loneliness in this study, comparably higher than a recent local survey with 10% of older adults having severe loneliness (Tung Wah Group of Hospitals, 2018). Since we collected data from July 2019 to November 2019, the higher prevalence of severe loneliness may be attributed to the social unrest in Hong Kong (Ni et al., 2020).

In the adjusted models, our findings shown that living with MDWs were associated with lower level of overall loneliness and emotional loneliness. According to the convoy model (Antonucci, 2001), MDWs could be an attachment figure alleviating the emotional loneliness of older adults in modern society. A systematic review (Chen et al., 2014) shown that family support is especially important in protecting Chinese older adults from loneliness. With an average household size less than 3 in Hong Kong (Census and Statistics Department, 2020), the adequacy of family support offered to older adults is questionable. In responses to the shortage of family caregiver, MDWs are hired to offer support to older adults (Chong, Kwan, Chi, Lou, & Leung, 2014). Internationally, there are examples of MDWs developing kinship-like relationship with older adults (Baldassar, Ferrero, & Portis, 2017). The convoy model posits that the quality of the convoy is more important than the quantity of contacts for an individual's wellbeing (Antonucci, 2001). The capacity of MDWs to employ emotional labour may directly support the development of quality convoy of older adults (Ho et al., 2019). As such, the development of closer relationship within the dyad may allow MDWs to become an attachment figure of older adults, alleviating their emotional loneliness and contributing to lower levels of overall loneliness.

Living with MDWs was not associated with a lower level of social loneliness. This finding might imply that MDWs were not able to improve the social integration of older adults. One possible reason might be the age gap and differences in language and culture between MDWs and older adults, impeding MDWs to support older adults effectively (Ayalon et al., 2012). There were also cases of family members preferring to leave the

caregiving solely to MDWs (Heng, Fan, & Chan, 2019), weakening the connections between older adults and family (Ayalon et al., 2012). Therefore, the social network from family might be weakened due to the presence of MDWs, in accordance with our findings that spouse and children were not associated with loneliness of older adults. Given social network was strongly associated with overall loneliness, emotional loneliness and social loneliness, further investigation on the barriers of social integration faced by older adults co-living with MDWs is needed.

In contrast to other studies (Chen et al., 2014; De Jong Gierveld et al., 2012; Dykstra & De Jong Gierveld, 2004; Pinquart, 2003), living alone, living with spouse, living with children, as well as marriage status were not associated with older adult loneliness in the adjusted model. A study showed that MDWs were able to alleviate the family caregiver distress (Chong, Kwan, Chi, Lou, & Leung, 2014). Meanwhile, family caregivers having greater ambivalent feelings (simultaneous positive and negative emotional experiences) towards care-recipients is associated with greater family caregiver distress (Losada, Pillemer, Márquez-González, Romero-Moreno, & Gallego-Alberto, 2017). Further, greater relationship ambivalence for older adults towards their family members is associated with increased loneliness in later life (Hua, Brown, & Bulanda, 2020). As such, we suggest future researches to investigate the mediator or moderator role of MDWS between family support and older adult loneliness. Preventing or alleviating loneliness is a high priority issue in public health. Currently, the rate of institutionalization of older adults in Hong Kong (6.8%) is higher than that in other Asian countries (Fang, Lou, & Kong, 2016). Future research on the dynamics of caregiving triad (older adult – MDWs – family caregiver) and its effect on older adult loneliness is suggested (Ayalon & Roziner, 2016).

Limitations

This study is limited by the cross-sectional design and nonprobability sampling. Although a quota sampling was applied to improve the representativeness, a longitudinal sample indicating the changes of co-living status (such as changing of MDWs across time), as well as the social unrest status, could yield more convincing results. Second, the participants were recruited from busy points of Hong Kong including subway exits and stations, they were already more visible and mobile to the society. Further research is needed to examine the situations of those less mobilized or even confined in one's own household because of various reasons (e.g. bedbound), even those with MDWs. Third, the LSNS mainly measured the density / breath of social network of older adults, but not the quality of social support, particularly from MDWs and family members. Future studies can directly measure the quality of social supports or using a qualitative approach to uncover the components of quality social supports. Finally, household incomes of older adults, ethnicity and language of MDWs should be included in future study as well. As the data collection was conducted face-to-face on a structured questionnaire by a research assistant, there might be self-reporting bias due to social desirability effect. As such, generalizing and implementing the results of this study to the whole population of older adults co-living with MDWs should be cautious.

Conclusions

This study showed that MDWs were associated with lower levels of loneliness of older adults, addressing the emerging phenomenon of older adults co-living with MDWs. Particularly, MDWs were associated with lower level of emotional loneliness, demonstrating their potential to develop bonding with older adults. However, MDWs were not associated with social loneliness of older adults, suggesting that MDWs were not able to improve the social integration of older adults. There is room to further investigate the barriers of social integration faced by older adults co-living with MDWs.

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