

## Research Article

# Multidimensional Intergenerational Relationship and Social Participation among Late-Life Migrants in China: The Role of Depressive Symptom

Yong-Xin Ruan <sup>1</sup> and Juan Wang <sup>2</sup>

<sup>1</sup>Department of Social Work, The Chinese University of Hong Kong, Hong Kong, China

<sup>2</sup>Department of Elderly Healthcare, Shenzhen Polytechnic University, Shenzhen, China

Correspondence should be addressed to Juan Wang; wangjuan@szpt.edu.cn

Received 13 September 2023; Revised 8 January 2024; Accepted 16 January 2024; Published 29 January 2024

Academic Editor: Zhiyong Lin

Copyright © 2024 Yong-Xin Ruan and Juan Wang. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Chinese adults will migrate to reunite with their children in later life, with social participation being an essential element of their successful adaptation. As children are older adults' primary source of support, this study aimed to investigate both the direct and indirect effects of multiple dimensions of intergenerational relationship quality on social participation through the incidence of depressive symptom. A cross-sectional survey was conducted in Shenzhen, China, with late-life migrants aged 50 years and above. Totally, 397 participants were included in this analysis. The intergenerational relationship was measured using the Intergenerational Relationship Quality Scale for Aging Chinese Parents, which covers four dimensions: structural-associational solidarity, affectual closeness, consensual-normative solidarity, and intergenerational conflicts. However, as the structural-associational solidarity and affectual closeness dimensions did not have acceptable reliability, the four-dimension model was instead validated by using exploratory factor analysis and confirmatory factor analysis. The same four-factor model was confirmed, with the noted exception that item 10 (helping with housework) was deleted on the basis that it presented weak factor loading. Bootstrapping was used to examine the direct and indirect effects of the four dimensions on social participation through depressive symptom. The results showed that only affective closeness and intergenerational conflict were associated with social participation. Depressive symptom was a partial mediator of the correlation between affective closeness and social participation, whereas depressive symptom did not have any mediating effect on the other dimensions of intergenerational relationship quality and social participation. These findings highlight the importance of affectual closeness and intergenerational conflict in the social participation of late-life migrants in China.

## 1. Introduction

It is common for older adults to migrate internally within China to reunite with their children in other cities for taking care of their grandchildren and receiving care from their own children [1, 2]. In 2015, 17 million older adults moved across provinces in China to reunite with their children [3]. Late-life migration not only disrupts older adults' social networks but also poses challenges with regard to establishing new social ties [4, 5]. Social participation is essential to facilitating the social integration of late-life migrants because it can broaden their social networks and promote

their aging well in place [6–10]. Social participation refers to engagement in outdoor social activities that lead to resource sharing and increased personal satisfaction [11]. However, late-life migrants in China have limited opportunities for social participation [12]. Over 80% of participants in two separate surveys reported that they seldom or never participated in any outdoor social activities [13, 14].

The results of some studies have indicated that family relationships can influence older adults' level of social participation [11, 15, 16]. Due to the inherent disruption that occurs with regard to their original social networks, children become the primary source of support for late-life migrants

[17, 18]. In addition, given the importance of intergenerational relationships in Chinese culture [19, 20], the quality of these relationships may influence late-life migrants' level of social participation. However, previous studies have mostly focused on the influence of intergenerational relationships on the physical and mental health of Chinese late-life migrants [21–25], without paying sufficient attention to their effects on these migrants' social adaptations. Intergenerational relationships are multidimensional and include solidarity and conflict domains [26, 27]. The existing literature on the intergenerational relationships of Chinese late-life migrants has mostly focused on the solidarity domain without considering the conflict domain [21–25]. How different dimensions of intergenerational relationship quality were related to late-life migrants' social participation remains to be explored. Thus, this study aimed to investigate the relationships between different dimensions of intergenerational relationship quality and social participation among late-life migrants in China.

## 2. Literature Review

*2.1. Intergenerational Relationship and Social Participation.* Intergenerational relationship quality comprises the solidarity and conflict domains. The solidarity domain includes five dimensions: associational (frequency of interactions and types of activities in which the family engages), structural (size and geographic proximity of the family), functional (exchange of support and resources), affectual (degree of affection and positive sentiments), consensual (agreement on beliefs and values), and normative (commitment to familial roles and obligations) [26]. Based on this model, Bai [28] developed and validated the Intergenerational Relationship Quality Scale for Aging Chinese Parents (IRQS-AP) for application to older Chinese adults and proposed a four-dimensional model of structural-associational solidarity, affectual closeness, consensual-normative solidarity, and intergenerational conflict. Structural-associational solidarity refers to residential proximity to children, frequency of contact with children (face-to-face/through social media), and assistance with housework for children. Affectual closeness focuses on perceived closeness and intimacy with children and the amount of financial support received from them. Consensual-normative solidarity emphasizes the similarity of general opinions, opinions on caring for parents, and opinions on social issues. Finally, intergenerational conflict stresses excessive demands from children, criticism from children, and strained feelings toward them. This study used Bai's model to examine the intergenerational relationship quality of late-life migrants in China.

Families play an important role in facilitating older adults' social participation [15]. Having family support and family members involved in social groups can motivate older adults to participate more socially [11, 16, 29, 30]. Children are among the main sources of support for older adults [31]. However, few studies to date have investigated the effects of intergenerational relationships on older adults' social participation. Only one study thus far has indicated that

financial and emotional support from children helps to facilitate older Chinese adults' participation in social activities [32]. However, focusing exclusively on social support does not help us understand the other dimensions of social relationships [33]. Support from children constitutes only one of the dimensions of intergenerational support. Late-life migrants usually live with children and receive hands-on care from them; however, they will also inevitably come into conflict with them [34, 35]. Therefore, intergenerational interactions have both positive and negative effects. This points to a clear need to comprehensively examine the influence of the quality of intergenerational relationships on social participation.

Some qualitative studies have indicated that the diverse dimensions of intergenerational relationship quality may have different relationships with social participation. Existing qualitative studies have shown that late-life migrants in China experience better social adaptation when they have intimate relationships with their own children. These studies have also reported a reduced willingness among late-life migrants to integrate into host cities when they have strained relationships with their children [2, 14, 36–39]. Thus, affectual closeness may be positively associated with social participation, whereas intergenerational conflict may be negatively associated. Structural-associational solidarity focuses on living proximity and frequency of contact with children. It is common for Chinese late-life migrants to live with their children because they need to take care of their grandchildren or receive care from their own children [1, 2]. Living with children does not imply high-quality intergenerational relationships because of the possible conflicts that arise from coresidence with children [40]. Although coresidence increases the likelihood of older adults' having daily contact with children, these kinds of contacts usually consist of routine interactions, instead of the type of contacts that can actually promote intergenerational intimacy [1]. In this case, although late-life migrants are likely to report high structural-associational solidarity, this does not guarantee more positive interactions with children. Therefore, structural-associational solidarity may not be related to social participation. For consensual-normative solidarity, late-life migrants report that they quarrel with their children because of disagreements about lifestyle and how grandchildren should be taken care of. This can cause them to feel distressed and reduce their interactions with others [13, 39]. Thus, it is possible that late-life migrants who have less consensual-normative solidarity with children may experience less social participation.

*2.2. The Mediating Effect of Depressive Symptom.* The International Classification of Functioning, Disability, and Health (ICF) model was developed by the World Health Organization (WHO) and is applicable to all people, irrespective of their health conditions and cultural contexts [41]. The ICF model acknowledges that environmental factors (e.g., support and relationships) influence individuals' functioning (e.g., psychological functioning) and

participation (e.g., social participation). Psychological functioning and social participation are mutually correlated. The ICF model also proposes that health conditions and sociodemographic factors are another factor influencing people's functioning and participation. These items are regarded as control variables in this study (Figure 1). The ICF model has been used to study the relationship between depressive symptom and social participation in older Chinese adults [42]. The results of a longitudinal study indicate that depressive symptom as a psychological function negatively influences older adults' social participation [42]. Therefore, based on the tenets of the ICF model, depressive symptom is a possible mediator between social relationships and social participation.

The quality of intergenerational relationships influences older adults' psychological functioning, because of socio-emotional selectivity theory stating that people emphasize emotional goals, such as deepening intimacy, when aging [43]. Older adults tend to interact with intimate social partners (e.g., family) and attach importance to relationship quality when seeking to satisfy their emotional needs [43, 44]. Accordingly, affectual closeness and consensual-normative solidarity have been found to be negatively correlated with depressive symptom in older adults in China [17, 45–47]. Conversely, intergenerational conflict has been found to be positively associated with depressive symptom [17, 45, 47]. The effect of structural-associational solidarity on depressive symptom is complex. The effect that living with children has on depression is dependent upon whether the older adults being assessed prefer to live with children [48]. Although filial piety encourages coresidence with children, older Chinese adults are expressing a growing demand for independence and privacy. Thus, living with children has been found to reduce depressive symptom in some older Chinese adults [46], while others have reported an increase in depressive symptom when living with children [40]. Late-life migrants in China usually live with their children regardless of whether this is their own personal preference or not [2, 14, 37–39]. It is likely that the effect that coresiding with children has on depressive symptom is cancelled out by the different degrees of willingness older adults express with regard to living with children. In addition, late-life migrants do not expect to have much frequent contact with their children, considering that they are busy at work; instead, they expect support when they are in need [37, 39]. A systematic review found that neither living with children nor the frequency of contact with children was associated with the incidence of depressive symptoms in Chinese late-life emigrants [49]. Therefore, structural-associational solidarity may not be related to depressive symptom.

Regarding the relationship between depressive symptom and social participation, the interactional theory of depression states that people with depressive symptom interact negatively with social partners [50]. For example, individuals with depressive symptoms are less inclined to make contact and interact with others [51, 52]. A longitudinal study found that older adults with more depressive symptoms engaged in less social participation [53]. Thus, depressive symptom is

negatively associated with social participation among older Chinese adults [7, 54–56]. Although depressive symptom has a reciprocal relationship with social participation, longitudinal studies have suggested that the effect of depressive symptom on social participation in older adults is stronger than the opposite effect [57, 58]. In summary, depressive symptom may mediate the relationship between the quality of intergenerational relationships and social participation among late-life migrants.

*2.3. The Present Study.* This study aimed to investigate the associations between different dimensions of intergenerational relationship quality and social participation and the possible mediating effect of depressive symptom. We hypothesized that the different dimensions of intergenerational relationship quality would have different relationships with social participation.

H1a: Structural-associational solidarity is not associated with social participation.

H1b: Affectual closeness is positively associated with social participation.

H1c: Consensual-normative solidarity is positively associated with social participation.

H1d: Intergenerational conflict is negatively associated with social participation.

In addition, depressive symptom had different mediating effects on the association between intergenerational relationships and social participation.

H2a: Depressive symptom is not a mediator between structural-associational solidarity and social participation.

H2b: Depressive symptom mediates the association between affectual closeness and social participation (i.e., late-life migrants with higher affectual closeness will report fewer depressive symptom, which in turn causes them to have more social participation).

H2c: Depressive symptom mediates the association between consensual-normative solidarity and social participation (i.e., late-life migrants with higher consensual-normative solidarity will report fewer depressive symptom, which in turn causes them to have more social participation).

H2d: Depressive symptom mediates the association between intergenerational conflict and social participation (i.e., late-life migrants with fewer intergenerational conflicts will report fewer depressive symptoms, which will in turn lead to more social participation).

### 3. Methods

*3.1. Participants and Sampling.* The data for this study came from a cross-sectional study exploring the social capital of older adults migrating with their children in China. This original study was conducted by the second author. The study participants were recruited between November 2019

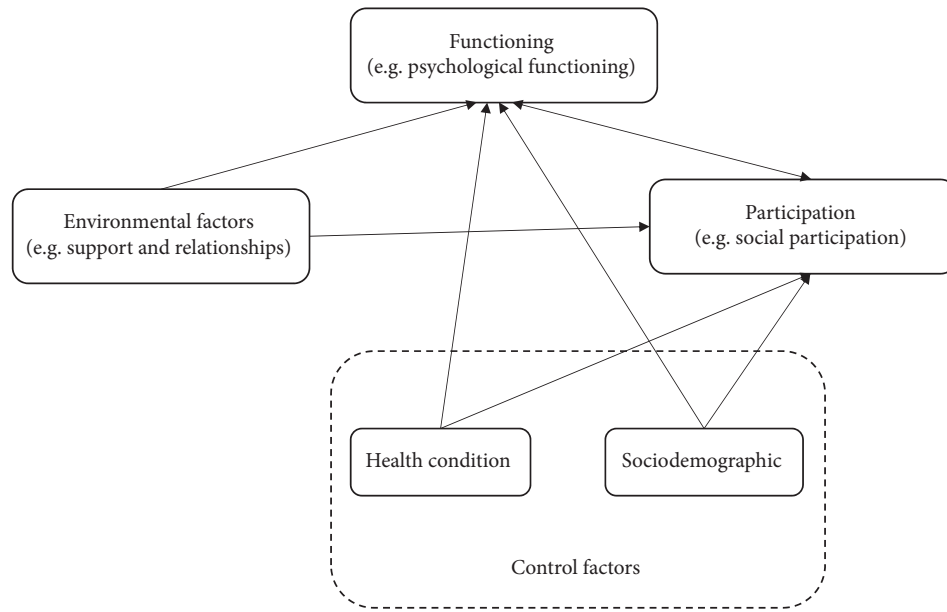


FIGURE 1: The international classification of functioning, disability, and health (ICF) model.

and January 2020 in Shenzhen, a city in Southern China. After being listed as a special economic zone, Shenzhen was constructed as a leading Chinese commercial center, one that has subsequently experienced rapid economic development [59]. Due to these circumstances, Shenzhen has attracted a large migrant population, which reached over 12 million in 2021 [60]. It is also a city with an increasing number of older individuals. The percentage of people in Shenzhen aged over 60 increased to 5.36% of the total population in 2021 [60]. Although there are no updated statistics currently available on older migrants in Shenzhen, it is reported to be one of the main metropolitan areas where late-life Chinese migrants choose to settle [3].

The participants for this study were selected using convenience sampling. Considering the varying levels of economic development throughout different districts in Shenzhen and the fact that residents may have different levels of socioeconomic status, participants were approached in two districts with more advanced development (i.e., Futian and Nanshan) and two districts with less urban development (i.e., Bao'an and Longhua). In each district, two social service agencies were contacted with 50 individual participants approached by each agency. Across the four districts, a total of 400 late-life migrants were willing to complete the survey. The inclusion criteria were as follows: (1) people aged 50 years and above, which is the minimum official retirement age in China; (2) people who had migrated to Shenzhen with their children; and (3) people who had resided in Shenzhen for over 6 months. After excluding three participants with missing data, 397 participants were included in the final analysis.

**3.2. Data Collection.** Surveys were completed through face-to-face interviews conducted by the staff in the community service centers, which lasted for approximately one hour. The staff received training from the corresponding authors

on how the interviews should be conducted. Before the interviews, the participants were informed about the aims of the research, the background of the researchers, their right to withdraw, their guarantee of confidentiality, and the potential associated risks and benefits. Written or verbal consent was obtained as appropriate. Coupons as thanks gifts were provided to the participants after the interviews. Ethical approval was gained (HSEARS 20190912001).

### 3.3. Measurements

**3.3.1. IRQS-AP.** IRQS-AP contains 13-items, which evaluates the four dimensions of intergenerational relationships: structural-associational solidarity (4 items), affectual closeness (3 items), consensual-normative solidarity (3 items), and intergenerational conflict (3 items) [28]. The participants were asked to rate the quality of their relationships with their children residing in Shenzhen. Participants with two or more children residing in Shenzhen were asked to think of a child whose birthday was approaching and to rate the quality of the relationship between that child and themselves [28]. Responses were made on a five-point Likert scale for each item with a response range of 1–5. Higher scores indicated better structural-associational solidarity, affectual closeness, consensual-normative solidarity, and more intergenerational conflict. Cronbach's alpha for the entire scale was 0.764. Cronbach's alphas were 0.64 for structural-associational solidarity, 0.698 for affectual closeness, 0.783 for intergenerational conflict, and 0.772 for consensual-normative solidarity.

**3.3.2. Depressive Symptom.** Depressive symptom was assessed using the Chinese version of the 15-item Geriatric Depression Scale (GDS-15). This scale has been previously

validated for use with older Chinese migrants [61, 62]. The scale contains 15 items that investigate feelings and behaviors that have occurred over the past week (5 positive items and 10 negative items). The participants chose yes (0) or no (1) for each item. Negative items were reverse coded. The total score for GDS-15 ranges from 0 to 15, with a higher score representing a higher incidence of depressive symptoms (Cronbach's  $\alpha = 0.71$ ).

**3.3.3. Social Participation.** The frequency with which participants had engaged in each of the nine social activities cited in the questionnaire over the last 12 months was also assessed. These activities included sports and physical activities, meeting friends, educational and cultural activities, volunteer work, and so on. Responses were rated on a five-point Likert scale (0 = never to 4 = several times a week). The highest frequency that occurred among the questions was adopted when participants who seldom participated in different activities scored higher than the participants who frequently engaged in certain activities [63, 64] (Cronbach's  $\alpha = 0.82$ ).

**3.3.4. Covariates.** The sociodemographic data included in the analysis were age, sex (0 = male, 1 = female), marital status (0 = separated/divorced/widowed, 1 = married), educational level (0 = primary school and below, 1 = secondary education, 2 = tertiary education), perceived economic status (0 = very insufficient to 4 = very sufficient), hometown (0 = rural area, 1 = urban area), and length of residence. Health-related factors were also considered, including self-rated health (0 = very poor to 4 = very good) and having any chronic disease (0 = no, 1 = yes).

**3.4. Data Analysis.** Descriptive analyses were performed to describe the participants' characteristics using Statistical Package for the Social Sciences (SPSS) 23. Assumptions of conducting regressions were examined, and the data fulfilled the requirements of homoscedasticity (the scatterplot showed that residuals were randomly scattered), independence (the Durbin–Watson value was 1.53, which was greater than 1.5), and no multicollinearity (variance inflation factor (VIF) values ranged from 1.136 to 1.66, which were all less than 5). However, the data were slightly left-leaning since the skew values of some variables were smaller than  $-2$ , while the kurtosis met the requirement of the range between  $-10$  and  $10$  (Table 1) [65].

Because the reliability of the structural-associational solidarity and affectual closeness subscales was lower than 0.7, which would influence the reliability of the results [66], the four-dimensional model needed to be validated. First, exploratory factor analysis (EFA) was performed in SPSS to examine whether the data fit the four-dimensional model using varimax rotation. Confirmatory factor analysis (CFA) was then conducted in Analysis of Moment Structures (AMOS) 23 to confirm the identified model. The following indices were used to assess the model fit [65]: (a) A chi-square index with smaller values suggested a better fit for the

model. (b) A comparative fit index (CFI) and a goodness-of-fit index (GFI) with values greater than 0.9 indicated a good fit. (c) The root mean square error of approximation (RMSEA) with values less than 0.08 showed an acceptable fit, while values below 0.05 indicated a good fit. The probability of close fit (PCLOSE) should also be greater than 0.05 for this method. (d) The standardized root mean square residual (SRMR) with 0.08 or less indicated a good fit. In addition, the reliability and validity of the model were evaluated using the methods recommended by Fornell and Larcker [67], which are commonly used to analyze the reliability and validity of measurement models [66]. The reliability of the model was examined using composite reliability [66, 67]. This method is more suitable for measuring the reliability of latent variables than Cronbach's alpha, which examines the extent to which observed variables constitute the latent variable and for which values greater than 0.7 show good reliability. Validity was assessed by examining convergent and discriminant validity. Good convergent validity was indicated by standardized factor loadings with values greater than 0.4 and an average variance extracted (AVE) value exceeding 0.5 [66, 67]. AVE examines the "average amount of variance that a construct explains in its indicators relative to the overall variance of its indicators" [66]. Discriminant validity was assessed by comparing the square root of the AVE of each dimension of intergenerational relationship quality and the correlations among these constructs. When the square root of AVE was greater than the interconstruct correlations, this meant that "the latent variable explains more variance of the indicators than another latent variable" [66]. Thus, discriminant validity was established. The above analyses were conducted using StatWiki software [68].

Subsequently, the regression weights and indirect effects in the structural model were assessed using bootstrapping with AMOS. This is a resampling procedure that addresses the non-normality issue in the data and examines the mediating effects [65]. Specifically, 2000 bootstrap resamples and 95% bias-corrected confidence intervals were applied. An indirect effect was considered significant when the confidence interval did not exceed zero.

## 4. Results

**4.1. Demographic Backgrounds of Participants.** The mean age of the 397 participants was 63.4 (SD = 6.7), and they had settled in Shenzhen for an average of seven years (SD = 5.3). Among them, 69% were female and 84.1% were married. Information regarding the other demographic factors is shown in Table 2. Participants averaged relatively low scores for depressive symptom ( $M = 3.39$ ,  $SD = 2.58$ ) and high scores for social participation ( $M = 3.48$ ,  $SD = 1.50$ ).

**4.2. Validation of the Measurement Model.** First, EFA was performed. The Kaiser–Meyer–Olkin value was 0.753, and Bartlett's test of sphericity reached statistical significance ( $p < 0.001$ ), indicating that the data were suitable for factor analysis [69]. A four-factor model with eigenvalues over 1 was obtained, which was the same as Bai's model (2017), except that

TABLE 1: Exploratory factor analysis of 13-item IRQS-AP ( $n = 397$ ).

|   | Mean (SD)    | Skewness | Kurtosis | Rotated component matrix |        |        |        | $\lambda$ | AVE   | CR |
|---|--------------|----------|----------|--------------------------|--------|--------|--------|-----------|-------|----|
|   |              |          |          | 1                        | 2      | 3      | 4      |           |       |    |
| Factor 1: intergenerational conflict (VE: 28.9%)  |              |          |          |                          |        |        |        | 0.549     | 0.785 |    |
| (6). How often do you have tense and strained feelings toward him/her?  | 1.66 (0.869) | 1.22     | 0.88     | 0.770                    | -0.028 | -0.094 | -0.277 | 0.769**   |       |    |
| (7). How often do you think he/she makes excessive demands on you?  | 1.70 (0.826) | 1.21     | 1.45     | 0.836                    | -0.051 | -0.035 | -0.105 | 0.775**   |       |    |
| (8). How often does he/she criticize you or your actions?   | 1.79 (0.847) | 1.02     | 1.01     | 0.804                    | -0.142 | 0.020  | 0.008  | 0.674**   |       |    |
| Factor 2: consensual-normative solidarity (VE: 15.8%)   |              |          |          |                          |        |        |        | 0.431     | 0.737 |    |
| (11). Overall, how similar are your opinions?   | 3.45 (0.811) | -0.21    | -0.13    | -0.262                   | 0.799  | -0.021 | 0.184  | 0.839**   |       |    |
| (12). How similar are your opinions on social issues?   | 3.22 (0.815) | 0.05     | -0.17    | -0.114                   | 0.851  | -0.043 | 0.012  | 0.717**   |       |    |
| (13). How similar are your opinions regarding government versus family responsibility for the care of older adults? | 3.50 (0.846) | -0.09    | -0.25    | -0.008                   | 0.725  | 0.070  | 0.276  | 0.624**   |       |    |
| (10). How often do you help with the household chores?  | 4.03 (1.071) | -1.27    | 1.11     | 0.139                    | 0.396  | 0.252  | 0.300  | 0.344**   |       |    |
| Factor 3: structural-associational solidarity (VE: 12.9%)   |              |          |          |                          |        |        |        | 0.558     | 0.783 |    |
| (1). How closely located are your homes?  | 4.71 (0.866) | -3.21    | 9.45     | 0.010                    | 0.080  | 0.804  | -0.011 | 0.629**   |       |    |
| (2). How often have you had face-to-face contact in the past 12 months?   | 4.71 (0.829) | -2.93    | 7.51     | -0.046                   | 0.019  | 0.885  | -0.020 | 0.959**   |       |    |
| (3). How often have you contacted each other by phone, letter, or e-mail in the past 12 months?                     | 4.57 (0.920) | -2.22    | 3.86     | -0.067                   | -0.028 | 0.762  | 0.093  | 0.599**   |       |    |
| Factor 4: affectual closeness (VE: 7.8%)  |              |          |          |                          |        |        |        | 0.556     | 0.770 |    |
| (4). What are your general feelings of closeness to him/her?  | 4.38 (0.748) | -1.03    | 0.90     | -0.365                   | 0.219  | 0.017  | 0.713  | 0.825**   |       |    |
| (5). How well do you get along with him/her?  | 4.31 (0.773) | -0.89    | 0.49     | -0.433                   | 0.231  | 0.004  | 0.714  | 0.925**   |       |    |
| (9). How often do you receive gift/money from him/her?  | 3.52 (0.928) | -0.73    | 0.29     | 0.036                    | 0.126  | 0.024  | 0.730  | 0.362**   |       |    |

Note. VE = variance explained; SD = standardized deviation;  $\lambda$  = standardized factor loading; AVE = average variance extracted; CR = composite reliability; \*\*  $p < 0.01$ ; \*  $p < 0.05$ .

TABLE 2: Characteristics of participants ( $n = 397$ ).

| Variables<br>(range of score)   | %/mean (SD) |
|---------------------------------|-------------|
| Age                             | 63.4 (6.7)  |
| Length of residence (year)      | 7.0 (5.3)   |
| Gender                          |             |
| Male                            | 31.0        |
| Female                          | 69.0        |
| Marital status                  |             |
| Married                         | 84.1        |
| Separated/divorced/widowed      | 15.9        |
| Educational level               |             |
| Primary school and below        | 37.0        |
| Secondary education             | 49.4        |
| Tertiary education              | 13.6        |
| Perceived economic status (0–4) | 2.31 (0.79) |
| Hometown                        |             |
| Rural areas                     | 43.6        |
| Urban areas                     | 56.4        |
| Self-rated health (0–4)         | 2.47 (0.76) |
| Having any chronic diseases     |             |
| No                              | 55.9        |
| Yes                             | 44.1        |
| Depressive symptom (0–15)       | 3.39 (2.58) |
| Social participation (0–4)      | 3.48 (1.50) |

Note. SD = standard deviation.

item 10 was loaded in the consensual-normative solidarity dimension (Table 1). Although the correlation of item 10 with the affectual closeness dimensions ( $r = 0.300$ ) was close to that recorded for consensual-normative solidarity ( $r = 0.396$ ), 0.32 is recommended as a threshold for minimum loading [70]. Thus, item 10 was regarded as being loaded in the consensual-normative solidarity. CFA was then conducted to verify the structures. The model showed an acceptable model fit ( $\chi^2 = 125.979$ ,  $df = 59$ ,  $p < 0.001$ ; CFI = 0.960; GFI = 0.955; RMSEA = 0.054, PCLOSE = 0.311, 90% CI (0.041, 0.066); SRMR = 0.0513). Although the composite reliability of all dimensions was above 0.7, consensual-normality solidarity had issues with convergent validity. The factor loading of item 10 was lower than 0.4. In addition, the AVE of this dimension was lower than 0.5 (Table 1), which indicated item 10 may not adequately explain the concept of consensual-normality solidarity. Thus, item 10 was deleted, and the validity of the adjusted model was checked using CFA.

The adapted model showed a better fit ( $\chi^2 = 85.246$ ,  $df = 48$ ,  $p < 0.05$ ; CFI = 0.977; GFI = 0.967; RMSEA = 0.044, PCLOSE = 0.717, 90% CI (0.028, 0.059); SRMR = 0.0430) and demonstrated good reliability because the composite reliability of each dimension was above 0.7 (Table 3). Regarding convergent validity, although the factor loading of item 9 was still lower than 0.4, the AVE values of all dimensions exceeded 0.5. Collier [65] suggested retaining the item if the AVE values reached the threshold of 0.5; however, models must also be validated in other samples. For discriminant validity, Table 3 shows that the square root of the AVE of each dimension (in bold) was greater than the interconstruct correlations, which demonstrates the good discriminant validity of the adapted model.

**4.3. Structural Model.** Based on the adapted model, the composite score of each dimension was calculated for the correlation analysis before conducting the path analysis. Correlations among the different dimensions of intergenerational relationship quality, depressive symptom, and social participation were examined using Spearman's rho due to skewed data (Table 4). Structural association solidarity was not significantly correlated with social participation ( $r = 0.02$ ,  $p = 0.77$ ). However, affectual closeness ( $r = 0.27$ ,  $p \leq 0.001$ ), consensual-normative solidarity ( $r = 0.11$ ,  $p = 0.03$ ), and intergenerational conflict ( $r = -0.31$ ,  $p \leq 0.001$ ) all had small but significant associations with social participation. Depressive symptom also had a weak but significant correlation with social participation ( $r = -0.30$ ,  $p \leq 0.001$ ). Structural-associational solidarity did not have a significant correlation with depressive symptom ( $r = -0.01$ ,  $p = 0.88$ ), while the other three dimensions of intergenerational relationship quality were significantly related to depressive symptom, despite the associations being small (affectual closeness:  $r = -0.25$ ,  $p \leq 0.001$ , consensual-normative solidarity:  $r = -0.13$ ,  $p \leq 0.001$ , and intergenerational conflict:  $r = 0.18$ ,  $p \leq 0.001$ ).

As the structural-associational solidarity dimension was not related to social participation, it was not included in the structural model. First, the relationships among the other three dimensions of relationship quality and social participation were examined with covariates included. The model was a just-identified model ( $\chi^2 = 0$ ,  $df = 0$ ; CFI = 1; GFI = 1; RMSEA = 0, PCLOSE = NA, 90% CI [0.00, 0.00]; SRMR = 0). Consensual-normative solidarity was no longer correlated with social participation ( $\beta = 0.062$ ,  $p = 0.312$ ). Conversely, affectual closeness remained positively and significantly correlated with social participation ( $\beta = 0.157$ ,  $p = 0.007$ ), while intergenerational conflict was negatively associated ( $\beta = -0.212$ ,  $p = 0.001$ ) (Table 5).

After including depressive symptom as a mediator, the model also became a just-identified model ( $\chi^2 = 0$ ,  $df = 0$ ; CFI = 1; GFI = 1; RMSEA = 0, PCLOSE = NA, 90% CI [0.00, 0.00]; SRMR = 0) (Figure 2). Consensual-normative solidarity did not have a significant indirect effect on social participation (95% CI:  $-0.027$ – $0.014$ ). However, affectual closeness did have a significant indirect effect (95% CI: 0.015 to 0.080), while the standardized indirect effect was 0.039. This means that late-life migrants who reported more affectual closeness with children expressed fewer depressive symptoms ( $\beta = -0.208$ ,  $p = 0.002$ ) while also being more active in social activities ( $\beta = -0.190$ ,  $p = 0.001$ ). Meanwhile, the direct effect of affectual closeness on social participation remained significant ( $\beta = 0.118$ ,  $p = 0.030$ ), indicating that depressive symptom had a partial mediating effect on the relationship between affectual closeness and social participation. Intergenerational conflict was not found to be related to depressive symptom ( $\beta = 0.063$ ,  $p = 0.243$ ), and the indirect effect was nonsignificant (95% CI:  $-0.041$  to 0.007). However, its direct effect on social participation remained significant ( $\beta = -0.200$ ,  $p = 0.001$ ). Among the covariates, late-life migrants reported more frequent social participation when they had a longer residence time and had attained a higher educational level.

TABLE 3: Factor loadings, reliability, and validity of the adapted model ( $n = 397$ ).

|                  | $\lambda$ | CR    | AVE   | SAS          | Discriminant validity |              |              |
|------------------|-----------|-------|-------|--------------|-----------------------|--------------|--------------|
|                  |           |       |       |              | AC                    | IC           | CNS          |
| Dimension 1: SAS |           | 0.783 | 0.559 | <b>0.747</b> |                       |              |              |
| Item 1           | 0.629**   |       |       |              |                       |              |              |
| Item 2           | 0.960**   |       |       |              |                       |              |              |
| Item 3           | 0.599**   |       |       |              |                       |              |              |
| Dimension 2: AC  |           | 0.770 | 0.556 | 0.066        | <b>0.745</b>          |              |              |
| Item 4           | 0.824**   |       |       |              |                       |              |              |
| Item 5           | 0.926**   |       |       |              |                       |              |              |
| Item 9           | 0.361**   |       |       |              |                       |              |              |
| Dimension 3: IC  |           | 0.785 | 0.549 | -0.073       | -0.572**              | <b>0.741</b> |              |
| Item 6           | 0.769**   |       |       |              |                       |              |              |
| Item 7           | 0.776**   |       |       |              |                       |              |              |
| Item 8           | 0.674**   |       |       |              |                       |              |              |
| Dimension 4: CNS |           | 0.775 | 0.537 | 0.035        | 0.529**               | -0.345**     | <b>0.733</b> |
| Item 11          | 0.817**   |       |       |              |                       |              |              |
| Item 12          | 0.741**   |       |       |              |                       |              |              |
| Item 13          | 0.628**   |       |       |              |                       |              |              |

Note. SAS = structural-associational solidarity; AC = affectual closeness; IC = intergenerational conflict; CNS = consensual-normative solidarity;  $\lambda$  = standardized factor loading; CR = composite reliability; AVE = average variance extracted; \*\*  $p < 0.01$ .

TABLE 4: Correlations for key variables included in the model: Spearman correlation ( $n = 397$ ).

|  | Mean (SD)    | 1     | 2       | 3       | 4       | 5       |
|--|--------------|-------|---------|---------|---------|---------|
| (1) Structural-associational solidarity (3–15) | 14.00 (2.15) |       |         |         |         |         |
| (2) Affectual closeness (3–15)                 | 12.21 (1.94) | 0.09  |         |         |         |         |
| (3) Consensual-normative solidarity (3–15)     | 10.17 (2.05) | 0.05  | 0.42**  |         |         |         |
| (4) Intergenerational conflict (3–15)          | 5.15 (2.12)  | -0.09 | -0.44** | -0.23** |         |         |
| (5) Depressive symptom (0–15)                  | 3.39 (2.58)  | -0.01 | -0.25** | -0.13** | 0.18**  |         |
| (6) Social participation (0–4)                 | 3.48 (1.50)  | 0.02  | 0.27**  | 0.11*   | -0.31** | -0.30** |

Notes. SD = standardized deviation. \*\*  $p < 0.01$ , \*  $p < 0.05$ .

TABLE 5: Pathways to social participation.

|                        | $\beta$  | $p$   | 95% CI           |
|------------------------|----------|-------|------------------|
| CNS-->SP               | 0.062    | 0.312 | (-0.164, 0.049)  |
| AC-->SP                | 0.157*   | 0.007 | (0.047, 0.266)   |
| IC-->SP                | -0.212** | 0.001 | (-0.302, -0.125) |
| Age-->SP               | -0.056   | 0.370 | (-0.159, 0.066)  |
| Gender-->SP            | 0.037    | 0.392 | (-0.050, 0.132)  |
| Education-->SP         | 0.180**  | 0.002 | (0.071, 0.287)   |
| Economic-->SP          | -0.009   | 0.891 | (-0.105, 0.095)  |
| Marriage-->SP          | 0.019    | 0.636 | (-0.068, 0.117)  |
| Resident length-->SP   | 0.250**  | 0.001 | (0.149, 0.348)   |
| Hometown-->SP          | -0.014   | 0.747 | (-0.121, 0.086)  |
| Self-rated health-->SP | 0.051    | 0.349 | (-0.053, 0.154)  |
| Chronic disease-->SP   | 0.004    | 0.954 | (-0.093, 0.108)  |

Notes.  $\beta$  = standardized regression weights; CNS = consensual-normative solidarity; AC = affectual closeness; IC = intergenerational conflict; \*\*  $p < 0.01$ ; \*  $p < 0.05$ .

### 5. Discussion

This study used Bai’s IRQS-AP to investigate the direct and indirect effects of the multiple dimensions of intergenerational relationship quality on social participation by exploring the incidence of depressive symptom among late-life migrants in China. This study found that item 10 (helping with housework) did not fit well for this target

group; therefore, this item was deleted, and an adapted model of intergenerational relationship quality was validated. The adapted dimensions of intergenerational relationship quality were further applied in the subsequent path analysis. The results showed that structural associational solidarity was not related to social participation, whereas affectual closeness and intergenerational conflict were significantly associated with social participation, as



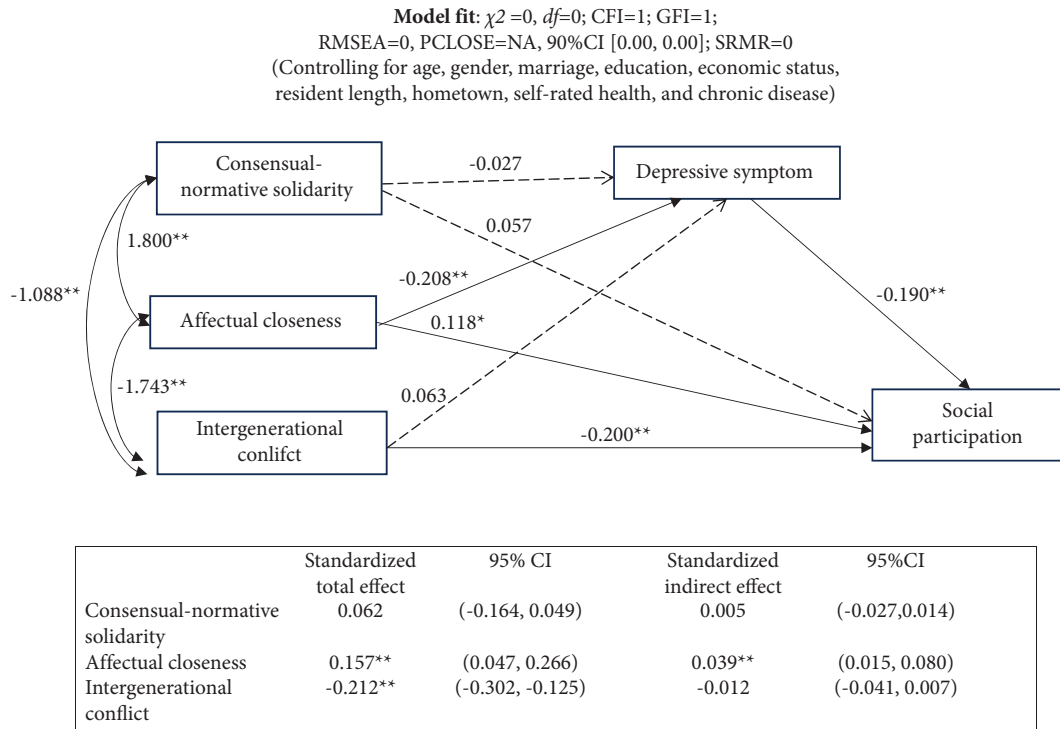


FIGURE 2: Results of mediation analysis. Note. \*\* $p < 0.001$ ; \* $p < 0.05$ .

previously hypothesized (H1a, H1b, and H1d). However, consensual-normative solidarity was found not to be related to social participation in the multivariate analysis, which failed to support H1c. Regarding the mediating effect of depressive symptom, the results showed that depressive symptom did not mediate the relationship between structural-associational solidarity and social participation but had a significant partial mediating effect on the association between affective closeness and social participation, supporting H2a and H2b. Contrary to H2c and H2d, depressive symptom was not a mediator of consensual-normative solidarity, intergenerational conflict, or social participation.

Item 10 was originally included in the structural-associational solidarity subscale because the scale was developed for community-dwelling older adults, and these older adults regard helping with housework as a chance to increase the frequency of intergenerational interactions [28]. However, this study found that item 10 was loaded in terms of consensual-normative solidarity, which focused on agreement on beliefs and filial responsibility. Unlike community-dwelling older adults, late-life migrants have complex feelings about helping with housework. Instead of receiving care from their children, Chinese late-life migrants usually provide an extensive amount of assistance regarding household chores [1]. In Ruan’s study, late-life migrants even complained about being treated as a “babysitter for free” [2]. Thus, this item relates to respondents’ level of agreement with filial responsibility. Sharing housework is also an action through which parents provide care for their children, and which enables the children to more easily work full-time [36, 71]. Item 10 also correlated with the affectual

closeness dimension to a certain extent. In this case, item 10 did not have a high factor loading in the consensual-normative solidarity dimension in the CFA process. The problematic nature of item 10 and the fact that item 9 presented weak loadings in the affectual closeness dimension indicates the differences that apply to the intergenerational interactions of late-life migrants and local older adults; therefore, Bai’s model may need to be further validated among more Chinese late-life migrants.

Supplemented by the ICF model, this study showed that the structural dimension of intergenerational relationship quality was not related to social participation among late-life migrants in China. However, social participation was found to be correlated with positive and negative intergenerational interactions (i.e., affectual closeness and intergenerational conflict). Consensual-normative solidarity significantly correlated with social participation in the bivariate analysis but not in the multivariate analysis when affectual closeness and intergenerational conflict were included. These findings indicate that affectual closeness and intergenerational conflict may explain the correlation between consensual-normative solidarity and social participation. For example, late-life migrants may experience conflicts with their children because of disagreements regarding lifestyle and grandparenting, causing them to report reduced social interactions [13, 39]. Future studies should examine whether affectual closeness and intergenerational conflict mediate the relationship between consensual-normative solidarity and social participation. In addition, supplemented by Wangliu’s [32] finding that intergenerational support is beneficial to older adults’ social participation, the findings of this study further indicate that intergenerational conflict is also related

to social participation. It should be noted that solidarity and conflict are not on opposite sides of this relationship and that improving solidarity does not necessarily mean reducing conflict. Family relations can exhibit both high solidarity and conflict or low solidarity and conflict [27]. Therefore, though a certain amount of correlation exists between both items, affectual closeness is a concept that is distinct from intergenerational conflict, with both items being significantly related to social participation. These findings suggest that improving affectual closeness with children may not be enough to facilitate greater social participation among late-life migrants and that reducing the intergenerational conflict they experience is also necessary.

Moreover, this study found that affectual closeness was correlated with social participation by influencing depressive symptom in late-life migrants. Consistent with the results of previous studies [17, 45–47], affectual closeness was found to be related to the incidence of depressive symptom. This is because older Chinese adults attach great importance to their intimate relationships with children. In particular, late-life migrants need support to ensure appropriate social adaptation. In this context, having close relationships with children enables them to feel supported and experience less emotional distress [2, 14, 36–39]. The partial mediating effect of depressive symptom on affectual closeness and social participation indicates the presence of other mediators such as life satisfaction. Wangliu [32] found that intergenerational support was related to social participation through life satisfaction. Surprisingly, the significant association between intergenerational conflict and depressive symptom disappeared in the multivariate analysis with the inclusion of affectual closeness, which contradicts the findings of a number of previous studies [17, 45, 47]. Zhou and Bai [47] found that among the dimensions of intergenerational relationship quality, affectual closeness had the strongest association with depressive symptom in older Chinese adults. Affectual closeness may have a greater influence on late-life migrants' depressive symptom than intergenerational conflict; therefore, the association between conflict with children and depressive symptom was not found to be significant. It is also possible that intergenerational conflict is related to social participation through other psychological functions, such as a sense of belonging to the host city. The results of two qualitative studies have indicated that late-life migrants who experience conflict with their children express their intention to return to their hometowns and report having fewer social interactions with others [37, 39]. However, further studies are needed to verify this relationship. Consistent with previous findings [7, 54–56], depressive symptoms are negatively related to social participation. This indicates that the degree of social participation of late-life migrants is related to their psychological functioning.

**5.1. Limitations.** This study had a number of limitations. First, this was a cross-sectional study, so the causal relationships among the variables were not tested, and a longitudinal design is needed to further verify the validity of the

study's findings. Second, this study used nonprobability sampling by conveniently sampling participants from social service agencies. It is likely that participants who seldom visited the agencies due to a decline in health or the presence of a disability were not approached. Thus, the findings recorded are only applicable to late-life migrants with good physical capabilities. Finally, this study found that certain items in IRQS-AP were not applicable to late-life migrants; however, it is also worth noting that the participants for this study were recruited exclusively from Shenzhen. Thus, the validity of IRQS-AP for late-life migrants in terms of its potential application to other cities must be investigated further.

## 6. Conclusion and Implication

This study investigated the correlations between the sub-dimensions of intergenerational relationship quality and social participation among late-life migrants in China and the possible mediating effect of depressive symptom on these correlations. Current interventions designed to facilitate the social adaptation of late-life migrants in China mainly focus on providing peer-support groups [72]. This study showed that affectual closeness and intergenerational conflict significantly correlated with social participation. This calls for practitioners to pay greater attention to these two types of intergenerational interactions when attempting to facilitate greater social participation among late-life migrants. Practitioners should especially focus on dealing with depressive feelings when late-life migrants report feeling or experiencing less closeness with their children. This may help to positively influence their level of social participation.

## Data Availability

The data used to support the findings of this study are available from the corresponding author upon reasonable request.

## Ethical Approval

Ethical approval was obtained from the Human Subject Ethics Sub-Committee of the Hong Kong Polytechnic University (HSEARS20190912001).

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Authors' Contributions

Yong-Xin Ruan and Juan Wang contributed equally to this work.

## References

- [1] X. Lin, C. Bryant, J. Boldero, and B. Dow, "Older Chinese immigrants' relationships with their children: a literature review from a solidarity-conflict perspective," *The Gerontologist*, vol. 55, no. 6, pp. 990–1005, 2015.

- [2] Y. Ruan, D. Zhu, and J. Lu, "Social adaptation and adaptation pressure among the "drifting elderly" in China: a qualitative study in Shanghai," *The International Journal of Health Planning and Management*, vol. 34, no. 2, 2019.
- [3] National Health Commission of the People's Republic of China, "The report of development of floating population in China 2016," 2016, <https://chinaldrk.org.cn/wjw/-/data/classify/subjectService/subject4>.
- [4] X. Y. Chen, "Research of applying casework on sociality issues of drifting elderly," M.Sc. thesis, Jing Gang Shan University, Ji'an, China, 2021.
- [5] H. Y. Wei, "A study on the psychological needs of the elderly migrant in cities and intervention in social work-Taking a community as an example," M.Sc. thesis, YunNan University of Finance and Economics, Kunming, China, 2022.
- [6] L. F. Carver, R. Beamish, S. P. Phillips, and M. Villeneuve, "A scoping review: social participation as a cornerstone of successful aging in place among rural older adults," *Geriatrics*, vol. 3, no. 4, p. 75, 2018.
- [7] C. Li, S. Jiang, N. Li, and Q. Zhang, "Influence of social participation on life satisfaction and depression among Chinese elderly: social support as a mediator," *Journal of Community Psychology*, vol. 46, no. 3, pp. 345–355, 2018.
- [8] S. Liu, Y. Hong, C. Gallois et al., "Contributors to social well-being from the perspective of older migrants in Australia," *Journal of Ethnic and Migration Studies*, vol. 49, no. 9, pp. 2247–2263, 2023.
- [9] V. A. Wright-St Clair and S. Nayar, "Resettling amidst a mood of loneliness: later-life Chinese, Indian and Korean immigrants in New Zealand," *Ageing and Society*, vol. 40, no. 11, pp. 2393–2409, 2020.
- [10] I. Y. Zhao, E. Holroyd, N. Garrett, V. A. Wright-St Clair, and S. Neville, "Chinese late-life immigrants' loneliness and social isolation in host countries: an integrative review," *Journal of Clinical Nursing*, vol. 32, no. 9-10, pp. 1615–1624, 2023.
- [11] B. G. Townsend, J. T. Chen, and V. M. Wuthrich, "Barriers and facilitators to social participation in older adults: a systematic literature review," *Clinical Gerontologist*, vol. 44, no. 4, pp. 359–380, 2021.
- [12] X. Yang and Y. Qian, "Social inclusion of the elderly migrants and influencing factors: a case study of Huilongguan in Beijing (in Chinese)," *Modern Urban Research*, pp. 23–37, 2019.
- [13] J. M. Xu, "Analysis of social adaptation issue of drifting elderly-survey in H city Jiangsu province (in Chinese)," *Social Welfare*, vol. 8, pp. 56–61, 2017.
- [14] T. T. Xu, "A probe into the practice of group work involving community integration of migrants: taking community A of Huangdao District, Qingdao as an example," M.Sc. thesis, Jiangxi University of Finance And Economics, Nanchang, China, 2020.
- [15] R. Amini, F. Mohammadi Shahboulaghi, K. Norouzi Tabrizi, and A. Setareh Forouzan, "Facilitators and barriers to social participation of community-dwelling older adults in Iran: a qualitative study," *Iranian Journal of Ageing*, vol. 16, no. 2, pp. 172–187, 2021.
- [16] A. Wanchai and D. Phrompayak, "A systematic review of factors influencing social participation of older adults," *Pacific Rim International Journal of Nursing Research*, vol. 23, no. 2, pp. 131–141, 2019.
- [17] J. Liu, X. Dong, D. Nguyen, and D. W. L. Lai, "Family relationships and depressive symptoms among Chinese older immigrants in the United States," *Journals of Gerontology: Medical Science*, vol. 72, no. suppl\_1, pp. S113–S118, 2017.
- [18] S. Yan, R. Deng, Y. Hou, L. Zhang, W. Zhang, and J. Yao, "A Latent class analysis of intergenerational relationships among the elderly migrants in Nanjing, China," *Psychology Research and Behavior Management*, vol. 16, pp. 1221–1232, 2023.
- [19] C. Li, S. Jiang, and X. Zhang, "Intergenerational relationship, family social support, and depression among Chinese elderly: a structural equation modeling analysis," *Journal of Affective Disorders*, vol. 248, pp. 73–80, 2019.
- [20] R. Zheng, M. Yu, L. Huang et al., "Effect of intergenerational exchange patterns and intergenerational relationship quality on depressive symptoms in the elderly: an empirical study on CHARLS data," *Frontiers in Public Health*, vol. 10, Article ID 1009781, 2022.
- [21] Q. Jia, S. Li, and F. Kong, "Association between intergenerational support, social integration, and subjective well-being among migrant elderly following children in Jinan, China," *Frontiers in Public Health*, vol. 10, Article ID 870428, 2022.
- [22] D. W. L. Lai, V. W. P. Lee, J. Li, and X. Dong, "The impact of intergenerational relationship on health and well-being of older Chinese Americans," *Journal of the American Geriatrics Society*, vol. 67, no. S3, pp. S557–S563, 2019.
- [23] W. Mao, L. Xu, M. Guo, and I. Chi, "Intergenerational support and functional limitations among older Chinese immigrants: does acculturation moderate their relationship?" *Journal of Ethnic and Cultural Diversity in Social Work*, vol. 27, no. 4, pp. 294–309, 2018.
- [24] L. Zhang, Y. Hou, H. Wang, and J. Yao, "Self-rated health and life satisfaction among elderly migrants in China: a moderated mediation model of resilience and upward intergenerational support," *International Journal of Environmental Research and Public Health*, vol. 19, no. 24, 2022.
- [25] X. Zheng, Y. Zhang, Y. Chen, and X. Fang, "Internal migration experience and depressive symptoms among middle-aged and older adults: evidence from China," *International Journal of Environmental Research and Public Health*, vol. 19, no. 1, 2021.
- [26] V. L. Bengtson and R. E. L. Roberts, "Intergenerational solidarity in aging families: an example of formal theory construction," *Journal of Marriage and Family*, vol. 53, no. 4, pp. 856–870, 1991.
- [27] A. Lowenstein, "Solidarity–conflict and ambivalence: testing two conceptual frameworks and their impact on quality of life for older family members," *Journal of Gerontology: Social Science*, vol. 62, no. 2, pp. S100–S107, 2007.
- [28] X. Bai, "Development and validation of a multidimensional intergenerational relationship quality scale for aging Chinese parents," *The Gerontologist*, vol. 58, no. 6, pp. e338–e348, 2017.
- [29] H. Ekstrom, S. Dahlin Ivanoff, and S. Elmstahl, "Does informal support influence social participation of fractured elderly people?" *Archives of Gerontology and Geriatrics*, vol. 56, no. 3, pp. 457–465, 2013.
- [30] G. Lindsay Smith, L. Banting, R. Eime, G. O'Sullivan, and J. G. Van Uffelen, "The association between social support and physical activity in older adults: a systematic review," *International Journal of Behavioral Nutrition and Physical Activity*, vol. 14, pp. 1–21, 2017.
- [31] L. Polizzi and C. J. Arias, "Bonds that provide the most satisfaction in elderly people's social support networks," *Pensando Psicologia*, vol. 10, no. 17, pp. 61–70, 2014.
- [32] Y. Q. Wangliu, "Does intergenerational support affect older people's social participation? An Empirical study of an older

- Chinese population,” *SSM-Population Health*, vol. 22, Article ID 101368, 2023.
- [33] L. F. Berkman, T. Glass, I. Brissette, and T. E. Seeman, “From social integration to health: durkheim in the new millennium,” *Social Science and Medicine*, vol. 51, no. 6, pp. 843–857, 2000.
- [34] S. Gao, K. Dupre, and C. Bosman, “Recreating a sense of home in a foreign land among older Chinese immigrants in Australia,” *Population, Space and Place*, vol. 28, 2021.
- [35] R. King, E. Cela, T. Fokkema, and J. Vullnetari, “The migration and well-being of the zero generation: transgenerational care, grandparenting, and loneliness amongst Albanian older people,” *Population, Space and Place*, vol. 20, no. 8, pp. 728–738, 2014.
- [36] W. W. Da and A. Garcia, “Later life migration: sociocultural adaptation and changes in quality of life at settlement among recent older Chinese immigrants in Canada,” *Activities, Adaptation and Aging*, vol. 39, no. 3, pp. 214–242, 2015.
- [37] Q. Li, “Intergeneration relations and the elderly immigrants’ adaptation-A qualitative study of Shanghai’s M community,” M.Sc. thesis, East China University of Science and Technology, Shanghai, China, 2013.
- [38] S. S. Ma, “Case study to improve the social integration of the migration for the elderly-Take the X community as an example,” M.Sc. thesis, LiaoNing University, Shenyang, China, 2019.
- [39] A. S. Yang, “The study on social adaptation of elderly immigrants from the perspective of intergenerational relations-Taking H community in Kunming as an example,” M.Sc. thesis, Yunan University, Kunming, China, 2018.
- [40] P. Lu, D. Kong, and M. Shelley, “Child-Parent relationships and older adults’ health: a cross-cultural comparison between China and the United States,” *Journal of Family Issues*, vol. 44, no. 6, pp. 1622–1636, 2021.
- [41] World Health Organization, “International classification of functioning, disability and health (ICF),” 2001, <https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health>.
- [42] C. Pan and N. Cao, “Dual trajectories of depression and social participation among Chinese older adults,” *Geriatric Nursing*, vol. 53, pp. 153–161, 2023.
- [43] L. L. Carstensen, H. H. Fung, and S. T. Charles, “Socio-emotional selectivity theory and the regulation of emotion in the second half of life,” *Motivation and Emotion*, vol. 27, pp. 103–123, 2003.
- [44] M. Piquart and S. Sorensen, “Risk factors for loneliness in adulthood and old age: a meta-analysis,” *Advances in Psychology Research*, vol. 19, no. 3, pp. 111–143, 2003.
- [45] Y. Y. Fu and X. W. Ji, “Intergenerational relationships and depressive symptoms among older adults in urban China: the roles of loneliness and insomnia symptoms,” *Health and Social Care in the Community*, vol. 28, no. 4, pp. 1310–1322, 2020.
- [46] M. Silverstein, Z. Cong, and S. Li, “Intergenerational transfers and living arrangements of older people in rural China: consequences for psychological well-being,” *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, vol. 61, no. 5, pp. S256–S266, 2006.
- [47] J. J. Zhou and X. Bai, “Influence of intergenerational relationships on depressive symptoms in ageing Chinese adults in Hong Kong: mediating effects of sense of loneliness,” *BMC Geriatrics*, vol. 22, no. 1, p. 587, 2022.
- [48] T. Chen, “Living arrangement preferences and realities for elderly Chinese: implications for subjective wellbeing,” *Ageing and Society*, vol. 39, no. 8, pp. 1557–1581, 2018.
- [49] M. Guo and M. Stensland, “A systematic review of correlates of depression among older Chinese and Korean immigrants: what we know and do not know,” *Aging and Mental Health*, vol. 22, no. 12, pp. 1535–1547, 2018.
- [50] C. Segrin and J. P. Dillard, “The interactional theory of depression: a meta-analysis of the research literature,” *Journal of Social and Clinical Psychology*, vol. 11, no. 1, pp. 43–70, 1992.
- [51] K. J. Rotenberg and J. Hamel, “Social interaction and depression in elderly individuals,” *The International Journal of Aging and Human Development*, vol. 27, no. 4, pp. 305–318, 1988.
- [52] C. I. Voils, J. C. Allaire, M. K. Olsen, D. C. Steffens, R. H. Hoyle, and H. B. Bosworth, “Five-year trajectories of social networks and social support in older adults with major depression,” *International Psychogeriatrics*, vol. 19, no. 6, pp. 1110–1124, 2007.
- [53] R. Wilkie, M. Blagojevic-Bucknall, J. Belcher, C. Chew-Graham, R. J. Lacey, and J. McBeth, “Widespread pain and depression are key modifiable risk factors associated with reduced social participation in older adults: a prospective cohort study in primary care,” *Medicine (Baltimore)*, vol. 95, no. 31, Article ID e4111, 2016.
- [54] W.-H. Chen, W.-I. Lin, S.-H. Chang, and L.-C. Mak, “Exploring relationships between physiological and psychological condition of seniors and their mobility and social activity,” *Transportation Research Record: Journal of the Transportation Research Board*, vol. 2537, no. 1, pp. 103–110, 2015.
- [55] X. Chen and X. Zhu, “Social participation and depression in middle-aged and senior citizens in China,” *Social Behavior and Personality: An International Journal*, vol. 50, no. 1, pp. 1–14, 2022.
- [56] R. M. Matt, “An Update on social activity and depression in the elderly: a brief review of recent findings and key issues,” *Healthy Aging and Clinical Care in the Elderly*, vol. 6, pp. 11–15, 2014.
- [57] Y. Ding, L. Chen, and Z. Zhang, “The relationship between social participation and depressive symptoms among Chinese middle-aged and older adults: a cross-lagged panel analysis,” *Frontiers in Public Health*, vol. 10, Article ID 996606, 2022.
- [58] N. Sirven and T. Debrand, “Social capital and health of older Europeans: causal pathways and health inequalities,” *Social Science and Medicine*, vol. 75, no. 7, pp. 1288–1295, 2012.
- [59] H. Yeung, “A tale of two cities- the development and reform experiences of Shenzhen and Shanghai,” *Journal of Chinese Economics and Business Studies*, vol. 13, no. 4, pp. 369–396, 2015.
- [60] The Shenzhen Statistics Bureau, “The report of the seventh census in Shenzhen-situation of migrant population,” 2021, [http://www.sz.gov.cn/cn/xxgk/zfxxgj/tjsj/tjgb/content/post\\_8772100.html](http://www.sz.gov.cn/cn/xxgk/zfxxgj/tjsj/tjgb/content/post_8772100.html).
- [61] B. C. Kuo, V. Chong, and J. Joseph, “Depression and its psychosocial correlates among older asian immigrants in North America,” *Journal of Aging and Health*, vol. 20, no. 6, pp. 615–652, 2008.
- [62] X. Lin, B. Haralambous, N. A. Pachana et al., “Screening for depression and anxiety among older Chinese immigrants living in Western countries: the use of the Geriatric Depression Scale (GDS) and the Geriatric Anxiety Inventory (GAI),” *Asia-Pacific Psychiatry*, vol. 8, no. 1, pp. 32–43, 2016.

- [63] J. Lim-Soh, S. Ang, and R. Malhotra, "Trajectories of informal and formal social participation after retirement," *Work, Aging and Retirement*, 2023.
- [64] Z. I. Santini, P. E. Jose, A. Koyanagi et al., "Formal social participation protects physical health through enhanced mental health: a longitudinal mediation analysis using three consecutive waves of the Survey of Health, Ageing and Retirement in Europe (SHARE)," *Social Science and Medicine*, vol. 251, Article ID 112906, 2020.
- [65] J. Collier, *Applied Structural Equation Modeling Using AMOS: Basic to Advanced Techniques*, Routledg, London, UK, 2020.
- [66] G. W. Cheung, H. D. Cooper-Thomas, R. S. Lau, and L. C. Wang, "Reporting reliability, convergent and discriminant validity with structural equation modeling: a review and best-practice recommendations," *Asia Pacific Journal of Management*, 2023.
- [67] C. Fornell and D. F. Larcker, "Evaluating structural equation models and unobservable variables and measurement error," *Journal of Marketing Research*, vol. 18, pp. 39–50, 1981.
- [68] J. Gaskin and J. Lim, "Master validity tool," in *AMOS Plugin Gaskination's StatWiki*, Brigham Young University, Provo, UT, USA, 2016.
- [69] J. Hair, R. Anderson, B. Babin, and W. Black, *Multivariate Data Analysis: A Global Perspective*, Pearson, Upper Saddle River, NJ, USA, 2010.
- [70] B. G. Tabachnick and L. S. Fidell, *Using Multivariate Statistics*, Allyn and Bacon, Boston, MA, USA, 2001.
- [71] X. Qi, "Floating grandparents: rethinking family obligation and intergenerational support," *International Sociology*, vol. 33, no. 6, pp. 761–777, 2018.
- [72] J. J. Wang and D. W. L. Lai, "Mental health of older migrants migrating along with adult children in China: a systematic review," *Ageing and Society*, vol. 42, no. 4, pp. 786–811, 2020.