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A mixed-methods study of adaption challenges and social networks of older urban relocators in China

Yiqi Wangliu^{1,2*}, Jing Guo³, Yang Hu⁴ and Yu Liu⁵

Abstract

Background Among the growing migrant population in China, older adults who choose to migrate with their children to provide caregiving for grandchildren have attracted scholarly attention. This study explored what challenges they have experienced in sociocultural and psychological adaptation process in host cities and what social support was effective based on the adaptation theory and stress and coping theory.

Methods The study employed a mixed-method study. Twenty-five older urban relocators participated in interviews and 376 older migrants completed a set of surveys. Interview responses were analysed with the thematic analysis approach and quantitative data were examined with linear regression analyses.

Results In the qualitative phase, interviews indicated that older urban relocators depended on not only social support from host cities, but also support from their hometown to deal with adaptation difficulties, so whether and how these types of support predicted different dimensions of adaptation was examined later through a questionnaire. In the quantitative phase, results of a survey showed that support from co-living children and new friends in the host city was the most effective protective factor to promote both sociocultural and psychological adaptation and support from community services was positively associated only with sociocultural adaptation.

Conclusion These findings provide a better understanding of how older urban relocators experienced new lives in host cities, and they could guide professionals to provide older adults with necessary support and promote older adults' adaptation to the current community.

Keywords Older urban relocators, Adaptation process, Social support, Mixed-methods study

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Background

As the labour market in China's large cities has developed in past decades, the population of rural-to-urban migrants has continually increased in recent decades. According to the 2020 census, the number of rural-to-urban migrants reached 375 million [1]. Among this population, the number of older urban relocators increased to 0.267 billion by 2021 [2, 3]. Among these relocators, some migrate with their adult children to take care of grandchildren because traditional Confucian values emphasize collectivist familism and intergenerational interdependence [4]. When these older adults move to a new place, they may face various challenges such as



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differences in customs, ways of living and changes in networks [5], which could hamper their adaptation process in host cities.

Previous empirical studies have revealed successful adaptation is essential for older urban relocators to maintain health and wellbeing [6, 7]. In previous studies, interpreting and studying adaptation process does not include in-depth analysis [8], which could provide a detailed and comprehensive picture of older urban relocators. For instance, although it has been suggested social networks might be connected to migrants' wellbeing [6–8], few studies classified them into different levels, such as interpersonal, community, or structural level analysis. Considering effects of the support received can vary depending on the level of support offered [9], to better understand the experiences of those older urban relocators, it is essential to utilize this approach to investigate why and how each level of social networks exert influence.

Social support belongs to one kind of social capital to promote their adaptation process [10–12]. Previous studies have proved that social support could impose an influence on subjective well-being among older urban relocators [12, 13]. Although there have been some qualitative studies exploring what social support they could perceive during the adaptation process [9, 11], there is a lack of quantitative studies examining how various types of social supports are associated with their adaptation process. If difficulties and effective social support could be identified, policymakers or professionals could take more targeted measures to support this group.

Literature review

Traditionally, Chinese older adults have brought their children up and then been supported by them in return during their old age [4], and this is still currently the case. In addition, a lack of social welfare and institutional care for older adults has further reinforced the expectation that caring for older adults is a responsibility that falls on the family [14]. However, this filial tradition has recently been challenged by transformations in living arrangements and family structure induced by migration [15]. With migrating to host cities with adult children, many older urban relocators live with their adult children and grandchildren. Chinese grandparents place great values on intergenerational bonds and providing assistance to family members which is closely linked to the desire for "family success" [16]. As a result, this strong emphasis on family success may manifest in the form of grandparents relocating or migrating to provide care for their grandchildren.

Adaptation process and acculturation theory

The adaptation process refers to whether and how relocators fit into the pre-existing structures of the receiving society (i.e., receiving the rules and values that exist in the receiving society, learning the mechanisms of his or her new economic, political, social, cultural, and, above all, political–institutional environment) [17]. In addition to the sociocultural perspective, the adaptation process also includes a strong psychosocial component because the change of lifestyles or social pressure can trigger the adaptation reaction [17]. As such, based on Ward, adaptation process is categorised into two dimensions: sociocultural adaptation and psychological adaptation [18]. The former refers to the degree to which migrants become used to their new social and cultural contexts [19]. The later refers to feelings of well-being, such as satisfaction with life [18]. Then Ward and his colleagues tended to explore predictors of these two aspects of adaptation, but they found in different cultural context, predictors could be different [20].

To explain adaptation process of migrants, acculturation theory is usually applied [21]. During the process of accepting and adapting to values and cultures from host city, marginalization occurs because individuals may find it difficult to leave their culture of origin and integrate into the host culture [22]. Although this theory is frequently used to understand the process by which immigrants adapt to their new host country, it can also be applied to internal migration, particularly in China, where internal migration often involves movement from rural to urban areas or between cities. The environmental differences between rural and urban areas can be significant in terms of language, customs, and ways of living. Those between cities can be obvious in social networks and customs. Acculturation theory proposes that individuals who migrate must adapt to new cultural norms, beliefs, and practices in order to successfully integrate into the new environment.

Previous studies have utilized this theory to explain international immigrants' acculturation and loneliness [23, 24]. A few studies applied this theory among the group of Chinese internal migrants, such as rural–urban migrants in urbanizing China [25, 26], or focusing on migrant adolescents' mental health [27]. Rural residents who migrated to urban areas encountered a different culture, lifestyle, and social environment. These differences presented challenges that migrants must navigate in order to successfully integrate into their new communities. Acculturation theory suggested that migrants must adjust to the new culture and social norms in order to achieve successful adjustment [22]. By adapting to the new cultural environment, migrants can better fit into their new homes and increase their opportunities for

success. However, few studies paid attention to internal older migrants' adaptation process from a comprehensive perspective of sociocultural and psychological aspects based on the acculturation theory.

Social support and adaptation process among migrants

In host cities, difficulties appear in language, customs, and culture and migration even transforms older migrants' social, family, and economic status [28, 29], which may slow down their adaptation process. How to overcome difficulties depends on how much resources individuals could utilize to cope with the environmental transformations.

According to the stress and coping model, during the adaptation process, coping resources play essential roles in navigating challenges and obstacles [30]. When older migrants encounter challenges in their host city, they may choose to deal with them based on their coping resources, depending on the situation. The core coping resource, social support refers to the sum of various supportive forces or factors in the social network and can greatly improve an individual's adaptation in a social context [31], which is categorised as formal and informal support [9, 12, 13]. Formal support refers to the formal network of social, health, financial and other services offered by public and private agencies or the community [32]. Informal support includes emotional, instrumental, or financial aid obtained from a personal social network, which strengthens individuals' problem-solving abilities and adaptive behaviour [33].

In international migration studies, social support is a protective factor for migrants' mental health [34, 35] and psychological well-being [36]. In Chinese context, social support in the host city promoted the adaptation of young migrants [37, 38] or migrant families [39].

Social support and adaptation process among older urban relocators

Traditional Chinese values emphasize intergenerational interdependence and collectivist familism, where older adults are expected to support their children and grandchildren, and in turn, receive care in their old age [4]. This cultural norm has been a cornerstone of family structures in China. However, urbanization and migration have disrupted these traditional patterns. Many older adults move to cities to support their adult children and grandchildren, often taking on caregiving roles. This shift has implications for both the older adults and the family units, as it requires adjustments in roles and responsibilities [16].

For older urban relocators, living far away from their country of origin, facing language barriers and living a different lifestyle, support from family, friends and

community has improved their psychological wellbeing and reduced loneliness [24]. For Chinese older urban relocators, qualitative research has found they adapted to the host city with support from adult children [9]. Other quantitative studies demonstrated that social support improved their wellbeing [13] and quality of life [40]. However, assessments of these studies mixed the support from family, friends and community, so we were unable to figure out which resource took a key effect. In addition, few studies have explored how social support enhances the adaptation of older urban relocators in China. Although older relocators have limited access to resources in host cities due to grandparenting and shrinking networks, whether and how support from hometown brings comfort to them is essential, which was either unexamined by previous studies.

Moreover, the role of grandparents in urban settings has become increasingly important as more families migrate to cities. Older urban relocators often provide essential childcare support, allowing their adult children to focus on work. This caregiving role, while fulfilling, can also be demanding and isolating. In addition, living with their children and grandchildren, they have to adjust their lifestyles and make compromises because their past lives may have been frugal compared with their children's lives as most of them experienced the difficult time for economic development [37]. Studies have shown that older urban relocators face significant challenges in adapting to new environments, including differences in customs, ways of living, and social networks [5]. These challenges can hinder their sociocultural and psychological adaptation in host cities [6, 7]. Although challenges may prevent older migrants from adapting to the new environment, according to the stress and coping model, social support could be protective resources in dealing with stress [41, 42].

In general, previous research has shown that successful adaptation to the host city is crucial for maintaining the health and well-being of these older migrants. However, existing literature provides limited insights into how different levels of social support (e.g., from family, friends, community services, and hometown connections) influence various dimensions of adaptation (sociocultural and psychological). This gap is particularly significant given the unique context of internal migration in China, where older adults face cultural, social, and lifestyle differences between rural and urban areas or between different cities. The aim of the study is to address this gap by exploring the specific challenges older urban relocators encounter during their adaptation process and identifying the types and sources of social support that are most effective in promoting their sociocultural and psychological adaptation. The following research questions were addressed:

RQ1. What challenges do older urban relocators encounter during the process of sociocultural and psychological adaptation?

RQ2. What types of social support could they obtain to facilitate their sociocultural and psychological adaptation?

RQ 3. How do different types of social support promote their sociocultural and psychological adaptation? What is the most effective support?

This understanding will provide valuable insights for policymakers and professionals to develop targeted interventions and support systems to enhance the well-being of older urban relocators in China.

Materials and methods

Context and study design

To address the research questions, firstly, the qualitative approach allowed for obtaining data that yielded thick descriptions of adaptation experienced by older migrants. During the interview process, in addition to difficulties appearing in sociocultural and psychological adaptation process, older urban relocators who participated in this study reported what social support they obtained to deal with difficulties. Then we modified and applied quantitative instruments to determine whether potential associations existed between different types of perceived support and two-dimensional adaptation. This exploratory sequential study where qualitative phase inquiry precedes quantitative survey placed an equal emphasis on answering the question of what challenges appear in different dimensions of adaptation and how various types of support promote adaptation [18, 43]. The equal integration of quantitative and qualitative findings could yield more meaningful insights than the findings of a single method and examine the mechanisms of social support and adaptation from qualitative phase [17].

Qualitative sampling and interview procedures

We conducted purposive sampling to recruit 25 older urban relocators to participate in semi-structured interviews between November and December 2021. The following criteria were applied: migrated from their hometown to a first-tier big city (i.e., Beijing, Shanghai, Guangzhou, and Shenzhen); lived in the host city for no less than six months so they have experienced the adaptation process [1]; 55 years or older, which is the minimum retirement age for females in China; the purpose of moving to the new city was to support their children or grandchildren. We partnered with community centers and local organizations in Beijing, Shanghai, Guangzhou, and Shenzhen to identify older migrants fitting our criteria. Initial participants referred others, expanding our

pool. We also posted recruitment messages on WeChat to reach a diverse sample. To build trust, we initiated contact through community leaders, provided detailed study information, and ensured transparency. The demographic characteristics of the interviewees are presented in [Appendix A](#).

These interviews lasted between 40 and 90 min. Questions include “How did you adapt to the new environment?” “What challenges did you encounter when you come to the new city?” “How did you feel about the weather/foods/new friends/living together with children...” “How did you deal with these challenges?” “When you need advice/support, who would you like to turn to?” etc.

Data analysis for the qualitative data

The coding was categorised to form patterns and themes using the thematic analysis approach following six steps [44]. In Stage 1, two researchers read transcripts and analyses the data individually. In Stage 2 researchers categorised the ideas of the respondents into concepts (such as sociocultural and psychological adaptation) and then go to the Stage 3 where themes were built (eg. sociocultural adaptation including community integration, medical security, etc.). The two researchers met to identify common themes. In Stage 4, researchers discussed and renewed the themes, and redefined the themes in Stage 5. In Stage 6, researchers wrote the report. The research questions guided the results of the themes. In discussing the findings, a pseudonym was assigned to each participant. Throughout the analysis, themes and subthemes were added, removed, or modified to ensure data saturation. Any disagreements between the coders were addressed through discussion until consensus was reached.

Quantitative sampling and data collection

As our previous interviews revealed different types of support from host cities and hometowns could become resources to deal with challenges, we conducted a face-to-face survey in Shenzhen, one of China's major migration destinations, to better capture the conditions and relationships between the adaptation and social support of older internal migrants. The survey was conducted in April 2022 in Shenzhen's four major districts: Nanshan, Futian, Luohu, and Bao'an because the number of migrant family is high in this city, and accordingly the increase of older migrants climbed by 73% from 2000 to 2020 [45]. We recruited four interviewers who had extensive experience conducting face-to-face surveys. They distributed the questionnaire to assess their adaptation and reception of social support along streets, in supermarkets, in living communities, and in parks in the four

districts. Building trust and rapport with participants was crucial for obtaining rich and reliable data. We initiated contact through community leaders or trusted intermediaries who could vouch for the study's legitimacy. This helped in gaining initial trust. During the initial contact, we provided detailed information about the study's purpose, procedures, and confidentiality measures. This transparency helped in building trust. The interviewers also targeted people who were no younger than 55 years old and who had moved to Shenzhen to care for their children or grandchildren. Respondents had to have lived in Shenzhen for no less than six months. The sample size was sufficient to detect statistical significance using multiple regression analysis, assuming an effect size of 0.1, 80% statistical power, and a significance level (α) of 0.05 [46]. Finally, 376 qualified respondents were selected. The demographic characteristics of the survey respondents are provided in [Appendix B](#).

Measurements for the survey

Sociocultural adaptation

Sociocultural adaptation was assessed using the translated revision and expansion of the sociocultural adaptation construct [47] based on various aspects appearing in interviews. For instance, the respondents were asked to rate how well they adapted to a list of activities on a five-point scale (1 = cannot adapt; 5 = adapt very well). The scores were averaged as an index to indicate sociocultural adaptation ($M = 3.69$; $SD = 0.58$; *Cronbach's alpha* = 0.80). To ensure the appropriateness of translation, the scale was translated and revised by professional psychologists and piloted in around 20 older adults to see whether they could understand.

Psychological adaptation

Psychological adaptation was assessed by the psychological well-being scale [48] including how people held an attitude towards life, social relationships, daily activities, future and other people's attitudes towards them, which comprehensively indicated older migrants' psychological reactions in interviews. This scale has been translated and widely applied in Chinese context [27, 33]. Responses to statements were rated on a five-point scale. The scores were averaged as an index to indicate psychological adaptation ($M = 3.93$; $SD = 0.39$; *Cronbach's alpha* = 0.66).

Social support

Social support was modified from the multidimensional approach [49]. We adjusted the scale based on the results of the qualitative interviews. As in interviews, emotional, informational and physical support from family, friends, hometown or the society appeared during the adaptation

process of older migrants, we modified these aspects of support from different networks.

The respondents were given a five-point scale to rate the frequencies at which they received different types of support (1 = never, 5 = always). In each dimension, we included items that fell into emotional, instrumental and informational support. The scores for each item were summed and then averaged to indicate various types of support received by the respondents (informal support from the host city: $M = 3.97$; $SD = 0.34$; *Cronbach's alpha* = 0.45; formal support from the host city: $M = 3.59$; $SD = 0.58$; *Cronbach's alpha* = 0.70; informal support from hometown ($M = 3.77$; $SD = 0.47$; *Cronbach's alpha* = 0.67). Because of the limited length of the questionnaire, only one item was included for each aspect of support—informational, emotional and instrumental. Therefore, the measurement may better capture the comprehensiveness of social support but lose some internal consistency. We then tested the mean inter-item correlation, which indicated internal consistency and reliability [50]. All mean inter-item correlations were between 0.05 and 0.15, which indicated an acceptable range. As older migrants contacted with family and friends in hometown through mobile phones, the frequency of using mobile phones to contact them was assessed on a five-point scale (1 = never; 5 = always; $M = 3.28$; $SD = 0.77$; *Cronbach's alpha* = 0.87).

The measurement instruments of each variable are provided in [Appendix C](#).

Data analysis for the survey

SPSS was utilized to analyse the survey data. Descriptive statistics were used to summarize the demographic characteristics of the respondents as these statistics provided a clear profile of the sample and ensured that the respondents were representative of the population of older urban relocators. Linear regression analyses were employed to examine the relationships between different types of social support and the two dimensions of adaptation (sociocultural and psychological). This analysis allowed the researchers to identify which types of social support were most beneficial for older urban relocators, providing valuable insights for policymakers and professionals aiming to improve the well-being of this population.

Results

Results of interviews

The interviews revealed that older urban relocators faced significant challenges in sociocultural adaptation, which could be categorized into environmental and relationship aspects. In terms of environmental adaptation, older

migrants struggled with community integration and social welfare issues, such as navigating new neighborhoods and accessing healthcare. These challenges were compounded by frequent relocations with their children, disrupting stable social networks. However, community services and activities, like local clubs and workshops, acted as protective factors, facilitating integration into the host community.

Regarding relationship adaptation, maintaining connections with family and friends in their hometowns was difficult, leading to feelings of homesickness and isolation. Caregiving responsibilities in the host city also caused role changes and conflicts with co-living children. Despite these challenges, regular contact with hometown networks through phone or video calls provided psychological comfort. Developing new social connections in the host city, such as friendships with other grandparents, helped mitigate loneliness and enhances a sense of belonging. Overall, the adaptation process was marked by an interplay of risk factors, like caregiving intensity and separation from familiar networks, and protective factors, such as community support and maintaining hometown connections.

Family support and formal social support promoting community integration

The most obvious challenge was the process of adaptation to the new living environment. Many older urban relocators reported it took them more than a half year to get familiar to the new community, especially for those from rural areas. For example, Ms. Ai noted, “When I need to go out, they [my children] have to take me there; otherwise, I will get lost”. Moreover, because of the frequent relocation of their children, older migrants reported that they were unable to maintain continuous relationships with their neighbours or to continue participating in social activities because they had to move with their children.

Regarding handling environmental challenges, support from adult children was the first resource that older relocators received. Because they were not familiar with the host city, they might depend on their children for instrumental support, such as shopping and seeking medical assistance. Specifically, when they encountered difficulties, they would first turn to their adult children for support. More than half older migrants mentioned they shared their feelings with their co-living children, which brought emotional comfort to them.

My adult children supported me to go shopping, going to the hospital, bank...They are willing to provide support. When I missed home, I talked with my daughter-in-law. Yes, they are helpful. (Mrs. Ai)

In addition, the community organised activities to promote the integration of older adults. Various leisure activities, such as dancing and singing groups, were organised to cater to older participants with different interests. Most older urban relocators regarded these activities as meaningful. For example, Mr. Li said, “I would like to participate in dancing and singing activities organized by our community because I can make friends who share same interests with me”. Another two relocators mentioned to help older adults keep abreast of the modern world, some communities provided mobile phone use workshops, which demonstrated searching for news online, online shopping, and taking and editing photos. In these social groups, older migrants were likely to develop social networks while they became familiar with the new technologies.

Enhancing medical security with informal and formal social support

The household registration (hukou) system in China is a registration system that links individuals to a specific geographic location, either rural or urban [9]. In terms of the medical system, hukou status plays an important role in determining individuals' access to medical care. Under the current system, individuals are only eligible for medical benefits in the city or region where their hukou is registered. This system has created significant challenges for relocators who may not have access to medical care in their new location. Older migrants reported they hesitated to go to the hospital when they were sick because the percentage of reimbursement was low. They all mentioned difficulties to obtain reimbursement because they had to travel back to their hometowns due to the household registration system [9, 51]. As such, family or friends in hometown supported them with reimbursement procedures. In addition, out-of-pocket payments were common in getting medical treatment and saving money for future use was also important. Most older relocators reported that the community organized yearly physical check-ups for older adults above 65 years old and this assistance supported them to detect diseases as early as possible.

My medical insurance is based in my hometown, so we can only obtain reimbursement if we are hospitalised; otherwise, we have to pay for registration fees and medicines ourselves. In addition, it takes a long time to obtain reimbursement, so we are afraid of becoming ill. (Mr. Tang)

Maintaining acquaintance-based networks to obtain psychological comfort

Most of the older relocators reported that they still had older parents or siblings in their hometowns. However,

because of their caregiving role and limited mobility during the pandemic, it was impossible for them to regularly visit their hometowns. For example, Mr. Cui said, “As my father and parents-in-law are still in my hometown, I pay a visit to them each month. Usually, I stay in hometown for a month and return to the host city because my wife needs my support in grandparenting”.

Although older migrants had left their hometowns, maintaining relationships with relatives and old friends could promote their well-being and strengthen their resilience. Mr. Kuang said, “I am able to get in touch with my good friends and classmates in my hometown right away via my phone. We talk with each other as long as we have time, which reduces my feelings of homesickness.” However, several older relocators reported that contact by mobile phone was not as satisfactory as meeting in person. Both Mr. Zheng and Mr. Xun expressed, “Although communication online is convenient, it is still a pity that we could not have dinner or talk face-to-face”. In addition, for some participants, digital literacy and mobile phone expenses hindered them from being in touch with their hometowns.

Older urban relocators also needed to adapt to potentially new changes in their relationships with their spouses. In this study, several relocators had moved to the host city without their spouses because they had not retired. Under these circumstances, in addition to the adaptation to a new environment, relocators had to maintain a remote relationship with their husband or wife using mobile devices and social media.

Adjusting to caregiving role with family and peer support

Living with children, older relocators may experience different life styles and family role changes. Based on traditional Chinese values of filial piety, parents are responsible for raising their children, and it is the responsibility of adult children to take care of their older parents [52]. However, after migration, the roles of these older adults changed. They were caring for their adult children or grandchildren, so they felt their self-control and autonomy had decreased. Although the lifestyles of many older migrants differ from those of their children, older relocators might choose to keep harmonious communication with them or even make compromises. Mr. Zheng said, “We, both sides, make compromises, of course. There are conflicts existing in our family. Most of the time I make compromises and let the conflicts go”.

To alleviate their psychological burden, older relocators shared feelings with friends they made in host cities. Most of the older relocators had developed social networks with other older adults through their

grandchildren's kindergarten, local communities, and activities organised by the neighbourhood. Many of whom were also grandparents. This collective identity brought them together. For example, Mr. Qian said, “I get to know some people when I take a walk with my grandchildren. When my grandson went to kindergarten, I became familiar with some of the grandparents of his classmates. We chatted with each other when we have problems”. Older relocators tried to seek psychological comfort from their friends both in host cities or hometown to help them accept the current situations. They encouraged each other that although migration was a passive choice because the grandchildren of these older relocators needed their care, they tried to emphasise the positive aspects of their caregiving role. They also shared pictures and interesting family stories with old friends and family in hometown to keep up to date with each other's lives.

I shared pictures of my grandson and my life here through WeChat with my friends in hometown and other host cities and they sent theirs. We shared sorrow and happiness. Although we could not meet in person, we could still encourage each other. (Mrs. Liang)

Improving psychological resilience with peer support in host cities

Some participants experienced feelings of homesickness and loneliness because they found it difficult to adjust to life in the new environment. Mr. Qian said, “I feel I have adapted to the new environment, but I still think it is more comfortable living in my hometown. I miss my hometown. This kind of homesickness comes from missing familiar people there”.

Moreover, instead of a traditional hierarchical family relationship, in which parents have the most authority and power, as grandparents, the older relocators' priority was caring for their children's family. However, faced with the demands of caregiving, some older relocators felt upset or overwhelmed. For example, Ms. Guo felt that she had been “sentenced to the caregiving role as the second grandchild was born”.

With negative emotions, older relocators were likely to seek emotional support to improve their resilience and encourage themselves to adapt to the current situation. Some older relocators communicated with their co-living children and some shared happiness and sorrow with other grandparents in the neighborhood. In developing friendships, it seemed that older relocators had inadvertently been mindful of their identities as relocators, not

locals. Mr. Zheng offered, “I did not have any friends in this community because people here are locals and have a higher educational background. But I am from the countryside, so I seldom talked with them”. Moreover, when they knew others who had migrated from the same hometown, it was easier to develop friendships. Subsequently, these relationships could become their preferred social contacts.

In summary, the qualitative results demonstrated that challenges in sociocultural and psychological adaptation process were inevitable for older migrants when they moved to their host cities. With support from host cities and hometowns, many of them tried to focus on the importance of family and adaptation to the caregiving role.

Results of the survey

Based on the interview findings, the association of different types of social support with sociocultural and psychological adaptation was examined. Then, whether each type of social support was associated with these two aspects of adaptation was determined via linear regression analysis while controlling for demographic variables, including age, gender, education, pension level, household registration type (*Hukou*), marital status, household size and self-rated health score.

Table 1 presents the correlations between the two aspects of adaptation and different dimensions of social support. Both informal support ($B = 0.168, p < 0.01$) and formal support ($B = 0.276, p < 0.01$) in the host city were significantly associated with sociocultural adaptation. Relationships with informal support from hometowns and technical support in connecting with hometowns were insignificant. However, all four dimensions of support were positively associated with psychological adaptation.

As shown in Table 2, when different types of support were entered into the model, informal support from relatives and friends in the host city and community services were positively related to sociocultural adaptation ($B = 0.276, SE = 0.091, p < 0.01$; $B = 0.23, SE = 0.049, p <$

Table 1 Bivariate analysis between adaptation and perceived social support

	Sociocultural adaptation	Psychological adaptation
Informal support in host city	0.168**	0.439**
Informal support from hometown	0.071	0.283**
Formal support from community	0.276**	0.127*
Mobile phone use to connect hometown	−0.095	0.282**

$N = 376$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 Regression models predicting socioecological adaptation ($N = 376$)

Variables	Model 1	Model 2
Informal support in host city		0.276 (0.091)**
Formal community support		0.223 (0.049)***
Informal support from hometown		0.053 (0.072)
Mobile use to connect hometown		−0.117 (0.037)
Age	−0.003 (0.007)	−0.005 (0.007)
Gender (Male = 1)	−0.104 (0.059)	−0.031 (0.058)
Education	−0.019 (0.063)	0.015 (0.064)
Pension	0.350 (0.091)***	0.296 (0.088)**
Household registration (<i>Hukou</i>) (Urban household = 1)	−0.140 (0.089)	−0.133 (0.087)
Marital Status (Partnered = 1)	0.136 (0.095)	0.064 (0.092)
Number of households	0.005 (0.043)	0.016 (0.042)
Self-rated health	0.164 (0.050)**	0.162 (0.048)**
_cons	3.078 (0.561)***	1.508 (0.674)*
R^2	0.104	0.198

$N = 376$. Unstandardized coefficients were reported; * $p < .05$; ** $p < .01$; *** $p < .001$

0.001), which implied that the sociocultural adaptation of older relocators who received high amounts of these two types of support would improve. Specifically, support from relatives and friends imposes more effect. Other types of perceived support (i.e., informal support from their hometown and technical support to connect with their hometown) were not statistically associated with sociocultural adaptation.

As shown in Table 3, informal support from family and friends in the host city was the most significantly

Table 3 Regression models predicting psychological adaptation

Variables	Model3	Model4
Informal support in host city		0.470 (0.060) ***
Formal community support		0.030 (0.032)
Informal support from hometown		0.084 (0.048)
Mobile use to connect hometown		0.009 (0.024)
Age	−0.003 (0.005)	0.003 (0.005)
Gender (Male = 1)	0.001 (0.042)	0.059 (0.038)
Education	0.117 (0.045) **	0.083 (0.042)
Pension	0.012 (0.064)	−0.020 (0.058)
Household registration (<i>Hukou</i>) (Urban household = 1)	−0.142 (0.063) *	−0.066 (0.057)
Marital Status (Partnered = 1)	−0.041 (0.067)	−0.093 (0.060)
Number of households	0.004 (0.031)	−0.023 (0.028)
Self-rated health	0.076 (0.035) *	0.091 (0.031) ***
_cons	3.892 (0.395) ***	1.228 (0.445) **
R^2	0.043	0.245

$N = 376$. Unstandardized coefficients were reported; * $p < .05$; ** $p < .01$; *** $p < .001$

associated with psychological adaptation ($B = 0.470$, $SE = 0.060$, $p < 0.001$).

In general, the quantitative results indicated that accessible support from family and friends in the host city could most significantly facilitate both sociocultural and psychological adaptation among older migrants who participated in this study. Community service support only marginally improved older migrants' sociocultural adaptation.

Discussion

In this study, the integration of qualitative and quantitative data allowed for a comprehensive exploration of the adaptation challenges and social support experiences of older urban relocators in China. The findings from both phases of the study were mutually reinforcing, providing a richer and more nuanced understanding of the phenomenon under investigation. The qualitative phase, involving in-depth interviews uncovered several key themes related to adaptation challenges and social support. These themes included difficulties in community integration, maintaining social networks, and the importance of family support. These qualitative insights directly informed the development of the survey instrument.

Individual stories of these older internal migrants revealed that older relocators struggled to adapt to the new environment. The most frequent reason for migration was to take care of grandchildren. However, this long-term caregiving role seemed endless, which is consistent with previous findings in the literature [53]. After their relocation, older relocators had to adapt to the weather, lifestyles, and new environments in their host cities. The qualitative findings provided a deeper contextual understanding of the adaptation process. For instance, the interviews revealed that older relocators often faced role changes and conflicts with co-living children due to caregiving responsibilities. This contextual information helped to interpret the quantitative results more accurately, as it highlighted the underlying reasons for the observed associations between social support and adaptation outcomes. Although living with children was their (reluctant) choice, most of the older relocators who participated in this study were forced to adjust their attitudes to be positive. This finding echoes the traditional Chinese value that parents invest themselves in their children not only for support when they are in need but also for the continuity of the family line [4, 54, 55]. This continuation of the family line is not a mere extension of one's life but is necessary for *chuan zhong jie dai* (i.e., to have a son to carry on the family name). Therefore,

parents sacrifice themselves for their children because they are driven by this cultural ideal [4].

The predominant factor in the adaptation of the older migrants was their perceived acquisition of different types of social support. The first type was supports from the family. The survey results confirmed that informal support from co-living children and new friends in the host city was the most effective protective factor for both sociocultural and psychological adaptation. This finding aligned with the qualitative narratives, where participants frequently mentioned the importance of these support sources. When older parents performed a caregiving role, their adult children fulfilled their responsibility to take care of them as they aged [14]. This dual function of caregiving indicated that in China, social welfare and resources for older adults are deficient [32, 56]. Therefore, older relocators needed to rely on their children for care in their old age care, and at the same time, they provided caregiving support for their children.

The quantitative analysis also revealed that community services were positively associated with sociocultural adaptation, further supporting the qualitative observations about the role of community activities in facilitating integration into the host city. Formal community services, such as body screening and volunteer activities, also encouraged older relocators to integrate into the host city because they promote equal distribution of opportunities and resources to these relocators [4].

In addition, although some older relocators reported having barriers to using mobile phones, such as heavy grandparenting tasks or a lack of digital media literacy, most of them were willing to maintain contact with their family and friends in their hometown through phone or video calls. They felt that informal support from their hometown was a welcome source of consolation. These findings echoed Berry's theory [57] that migrants maintain their original culture, lifestyles and networks while integrating into their host culture. Based on the results of the present study, this theory could be applied to older relocators in China.

More importantly, the pandemic context profoundly influenced the participants' experiences of relocation and social network maintenance. Older relocators faced heightened isolation due to social distancing measures, limiting their ability to visit family and friends in their hometowns. The closure of schools and childcare facilities increased their caregiving responsibilities, further restricting their opportunities for social engagement. The reliance on digital communication tools like WeChat became essential for maintaining social connections, but

it also highlighted digital literacy challenges for some participants. Community activities, which are vital for social integration, were often canceled or moved online, making it more difficult for older migrants to build new social networks. These pandemic-related factors exacerbated the challenges of adaptation and underscored the importance of accessible social support systems.

The findings of this study align closely with the broader goals of promoting healthy aging, as outlined in the context of rapid population aging and its associated challenges. Specifically, the support from co-living children and new friends in the host city emerged as a significant protective factor for both sociocultural and psychological adaptation. This support helps older adults meet their basic needs, build and maintain relationships, and contribute to society, all of which are key components of healthy aging [58]. Moreover, relevant findings emphasize the importance of a healthy lifestyle for older adults, including maintaining social connections, engaging in regular physical activity, and accessing healthcare services. By focusing on these aspects, this study supports the broader objectives of promoting healthy aging, as outlined in global initiatives such as the WHO's Decade of Healthy Aging 2020–2030.

Theoretically, the findings of this study revealed that the essence of acculturation theory is a person-in-environment transactional process of stress and coping. Living in a new environment, older relocators inevitably encounter various difficulties during the acculturation process. According to the theory of stress and coping, these challenges are stressors that negatively affected their well-being and health. The strategies they utilised to cope with their stressors further showed the relationship between acculturation and the stress and coping paradigm [57]. For instance, when older relocators encountered heavy grandparenting duties, they shared emotions with family and friends. This cognition and psychological construction supported their adaptation to the host city. Hence, this finding indicates that stress and coping are inherent aspects of the adaptation process of older relocators. In addition, according to acculturation theory, relocators are involved in both their original and host cultures. Similarly, results showed that support from their hometown, mainly through mobile technology, was as important as the support available in the host city. Thus, the stress and coping model could be extended by incorporating factors concerning hometown support.

The findings of this study have several practical implications. As different types of social support can be effective in different dimensions of adaptation process, contextual and individual-level resources should be considered

alongside network types. First, to facilitate the adaptation of older relocators, the improvement of elderly services which includes health education and medical reimbursement for those with chronic diseases is necessary. Local communities should promote social activities for older relocators. Second, because maintaining ties through mobile technology is a main facilitator of psychological adaptation, local communities should consider organising workshops to enhance technological literacy among older relocators, which would enable them to stay in touch with their friends and family both in the host city and their hometowns. In the Chinese context, a major challenge for older relocators is that they devote most of their time to grandparenting, which restricts them from social participation and networks development. Therefore, relevant policies are needed to alleviate the caregiving burden of them. Considering older relocators' primary resources of support are their co-living children and neighbours, filial piety within the family and mutual assistance in neighbourhoods should be promoted.

This study has the following limitations. First, the application of a cross-sectional survey design could not determine the causal effects of different types of social support on two aspects of adaptation. Second, because of its feasibility, the survey used a non-probability sampling strategy and focused only on older relocators in Shenzhen, which may restrict the generalizability of the results. Third, the study's timing during the COVID-19 pandemic in 2021 had significant implications for both methodology and participants' experiences. Due to strict travel restrictions in China, some interviews were conducted online via WeChat video or audio calls. This adaptation allowed the research to proceed while adhering to public health guidelines but introduced challenges such as potential technical issues and the absence of non-verbal cues, which can be crucial for understanding participants' emotions and context.

Conclusion

This study demonstrated older urban relocators encountered challenges in community integration, medical security, social networks maintenance, caregiving intensity, etc. As effective support resources, social support from either host cities or hometown could become protective factors for adaptation. This study extends the understanding of acculturation theory and its application to social adaptation by drawing on the case of older relocators in China. Moreover, the study demonstrated that stress and coping process is inevitable—it plays a vital role in adaptation among older relocators.

Appendix

Table 4 Appendix A Characteristics of participants in qualitative interviews

Variables	Percentages or Numbers	
Age	55-60	6
	61-70	12
	71-80	6
	>80	1
Gender	Male	32%
	Female	68%
Household registration (<i>Hukou</i>)	Urban	72%
	Rural	28%
Pension	With	68%
	Without	32%
Length of stay (years)	0-3	8
	4-10	9
	>=10	8

N = 25

Table 5 Appendix B Descriptive analyses of variables in quantitative phase

Variables	Mean or Proportion	
Age		63.620
Gender	Male	43.9%
	Female	56.1%
Education	Primary School or lower	6.4%
	Middle School	39.4%
	High School	34.8%
	College diploma or above	19.4%
Household registration	Urban	49.5%
	Rural	50.5%
Marital status	Partnered	88%
	Non-partnered	12%
Pension (Monthly)	None	38.8%
	Less than 1000 RMB	10.4%
	1,000-2,999 RMB	29.5%
	3,000-4,999 RMB	19.1%
	5,000-7,999 RMB	2.1%
	Above 7,999 RMB	0
Household size	3	34.0%
	4	52.7%
	5	12.8%
	6 or more	0.5%
Self-rated health		3.640 (0.031)

N = 376

Table 6 Appendix C Measurements of Key Variables in Phase 2 (Quantitative Survey)

Scales	Items
Sociocultural adaptation	I can build and maintain relationships.
	I have maintained my hobbies and interests.
	I pay attention to local social events.
	I am involved in community activities.
	I have a good sense of direction in the host city.
Psychological adaptation	I can fit with the pace of life in the host city.
	I lead a purposeful and meaningful life
	My social relationships are supportive and rewarding.
	I am engaged and interested in my daily activities.
	I actively contribute to the happiness and well-being of others.
Social support	I am competent and capable in the activities that are important to me.
	I am a good person and live a good life.
	I am optimistic about my future.
	People respect me.
	<i>Informal support from the host city</i>
	<i>From co-living children</i>
	Emotional support: They give you affection and listen to you when you want to talk and express your feelings.
	Instrumental support: They are willing to do specific things for you, like helping with housework or any other activity.
	Informational support: They give you useful tips and information to deal with questions, problems, or everyday tasks.
	<i>From new friends</i>
	Emotional support: They give you affection and listen to you when you want to talk and express your feelings.
	Instrumental support: They are willing to do specific things for you, like helping with housework or any other activity.
	Informational support: They give you useful tips and information to deal with questions, problems, or everyday tasks.
	<i>Formal support from the host city</i>
	Emotional support: When you have difficulties, you are able to find people working in the community to report.
	Instrumental support: You are able to obtain support you need in the local community.
	Informational support: When you have difficulties, local community can provide with relevant information.
	<i>Informal support from the hometown</i>
	<i>From family members</i>
	Emotional support: They give you affection and listen to you when you want to talk and express your feelings.
	Instrumental support: They are willing to do specific things for you, like helping with housework or any other activity.
	Informational support: They give you useful tips and information to deal with questions, problems, or everyday tasks.
	<i>From old friends</i>
	Emotional support: They give you affection and listen to you when you want to talk and express your feelings.
	Instrumental support: They are willing to do specific things for you, like helping with housework or any other activity.

Scales	Items
	Informational support: They give you useful tips and information to deal with questions, problems, or everyday tasks.
Mobile use for connection with the hometown	I call friends and relatives in my hometown. I have video chat with friends and relatives in my hometown. I share photos or videos with family and friends in my hometown. I stay informed about the current situations of relatives and friends in my hometown through social media (such as WeChat Moments and Douyin posting).

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Authors' contributions

Study concept and design: WANGLIU Yiqi, GUO Jing. Acquisition of data: WANGLIU Yiqi, GUO Jing, HU Yang, LIU Yu. Drafting of the manuscript: WANGLIU Yiqi. Critical revision of the manuscript for important intellectual content: WANGLIU Yiqi, GUO Jing, HU Yang. Formal Analysis: WANGLIU Yiqi. Writing – Review & Editing: WANGLIU Yiqi, GUO Jing, HU Yang, LIU Yu.

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Data availability

The data used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

All research subjects participated voluntarily and provided informed consent to participate in the study. The study was approved by the Survey and Behavioural Research Ethics Committee at The Chinese University of Hong Kong (Reference No. SBRE-21–0193).

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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