MUTUAL SUPPORT IN THE COMMUNITY

Mechanisms and psychosocial impact on older people

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COLOFON

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CHAPTER 1

General Introduction

BACKGROUND

The global population is aging rapidly. According to the World Health Organization, the number of people aged 60 and above will reach 2.1 billion by 2050, accounting for 22% of the global population (WHO, 2019). This demographic shift toward older ages occurs in both high-income, low- and middle-income countries (LMICs), despite their various socioeconomic and cultural-political environments (United Nations Population Fund, 2012). Consequently, this shift is increasing pressure on both professional formal care systems and family-based informal care systems (Dieleman et al., 2016). Many countries have therefore been promoting the development of community-based support systems to fill the gap between formal and informal support. Facilitating mutual support among older people within the community is viewed as a potential solution that can alleviate healthcare stress and promote active aging (Kayser et al., 2019; Sánchez & Hatton-Yeo, 2012). However, research evidence on facilitating mechanisms and impact on older people of this community-based mutual support remains unclear. In this thesis, we adopt the concept of community-based mutual support as a system where older people can participate and engage in various informal support interactions within the community and outside of family settings, regardless of the involvement of formal organizations. With investigations in different contexts, this thesis aims to identify the mechanisms that facilitate older people's participation in community-based mutual support, and its psychosocial impact on community-dwelling older people.

Formal support, informal support and community-based mutual support for older people

Formal care and support, primarily provided through institutionalized services, account for a significant portion of healthcare expenditures in many countries (OECD, 2021). However, the absolute and relative increase in the aged population has led to cutbacks in healthcare budgets and is straining current health and social care systems (Prince et al., 2015). Governments across countries are therefore advocating for older people to increase their reliance on informal support networks, including their family members, friends, and neighbors (Pani-Harreman et al., 2021). However, family-based informal support may not be sustainable in the future either (Lindt et al., 2020). Family structures have changed significantly over the past decades due to factors like low fertility, urbanization and migration. Adult children are moving away from their hometowns in search of employment and are therefore not able to provide personal support to their older parents. Furthermore, family members who have been traditionally considered the primary informal support givers, such as spouses, are at risk of becoming overburdened (Pearlin et al., 1990). Meanwhile, the increase in life expectancy presents potential opportunities to create social benefits with the active involvement of older people (Beard et al.,

2016). In response, the WHO has launched its Global Network for Age-Friendly Cities and Communities, promoting the engagement of older people in their communities (WHO, 2018). Concepts of active aging and healthy aging have been adopted as guiding frameworks, in which aging is defined as a process of optimizing opportunities for health, participation, and security to enhance the quality of life as people age (Foster & Walker, 2015; WHO, 2019). These frameworks explicitly emphasize the importance of older people's participation and involvement in the communities they live in.

Given the growing pressure on healthcare delivery systems worldwide alongside the increasing recognition of the active perspective towards older people, governments and social organizations have been compelled to rethink the design of support systems for older people and to seek alternative solutions. One approach gaining attention is promoting mutual support among community-dwelling older people within their communities. This approach extends informal support beyond family members to include neighbors, friends, and the community organizations in the neighborhood where older people reside. The idea supporting this approach aligns with the active aging perspective that older people are valuable social assets to the community who can remain engaged and contribute meaningfully to society (Boerio et al., 2023; Foster & Walker, 2015; Kayser et al., 2019).

Paths toward community-based mutual support in different contexts

The trend of promoting community-based mutual support is evident across countries, though the development paths vary by context. In this section, paths toward community-based mutual support in the Netherlands and in China will be presented, respectively.

Shift in the Netherlands: from institutionalized care to community-based care
In the Netherlands, the healthcare expenditures for older people had been rising with the economic expansion. In 2021, expenditure on long-term care accounted for 4.1 percent of GDP (OECD, 2021). Dutch older people were primarily supported by an extensive welfare system for decades, largely through government-funded long-term care services (Maarse & Jeurissen, 2016). However, the sustainability of this generous support model is facing significant challenges. The decreasing mortality rate and increasing life expectancies have resulted in a growing demand for care services, placing pressure on the health and social care system. Meanwhile, the economic crises in recent decades have strained public resources, and limited governments' capacity to sustain extensive formal care provisions. As a response, the Dutch government has implemented reforms aimed at shifting part of the care responsibilities from the public sector to other sectors, thereby promoting a more balanced approach to support older people. A significant step was the Social Support Act

(Wet maatschappelijke ondersteuning, WMO), which was introduced in 2007, aiming to decentralize care responsibility from the national government to municipalities. According to the WMO, the municipalities are responsible for facilitating a civil society in which vulnerable groups are able to continue participating in the community, with the involvement of community organizations, non-profits and private entities in social service delivery (Dijkhoff, 2014). The updated WMO in 2015 explicitly encourages individuals to rely more on their informal social network, including family, friends and neighbors instead of formal support systems. Municipalities and local communities are tasked to facilitate these support networks through various initiatives such as volunteer programs and local care projects. The ultimate goal is not only to support aging in place, but also to cultivate a participatory society, where informal support complements formal care, benefiting both individual well-being and the sustainability of the healthcare system (Groenou, Broese van I. & De Boer, 2016).

In the context of shifting care responsibility and the advocacy of active participation among older people, numerous social organizations such as citizens' initiatives have emerged to promote care and welfare for community-dwelling older people (Van Der Knaap et al., 2019). In these initiatives, organizing mutual support in the community is viewed not only as a solution to increase the ability to react to the specific needs of the community, but also as a way to facilitate solidarity, which has been seen eroded by the welfare state that needs to be re-developed (Groenou, Broese van I. & De Boer, 2016). However, while promoting mutual support is often a central aim of these community initiatives, the mechanisms through which these initiatives facilitate mutual support, and the impact of mutual support behavior on older people's psychosocial health, remain insufficiently understood. Understanding the mechanisms and outcomes will provide valuable insights for shaping sustainable care systems that integrate informal support and formal support resources, which align with the broader goal of active aging.

Shift in China: from filial piety to community-based care

As health and social care systems in welfare states shift from institutionalized care to community-based care among community-dwelling older people, countries with different economic and cultural contexts, such as China, are also committed to developing mutual support in communities (Tang et al., 2023; Yao et al., 2022; Yao & Tan, 2021). However, unlike the Western transition driven by pressures on welfare states and a growing emphasis on civil society, China has undergone a different path towards community-based mutual support. Understanding mutual support in diverse contexts can help to build a more comprehensive framework for community-based mutual support that adapts to each context's specific needs.

Traditionally, older people in China have relied on support from family members, particularly from co-residing adult children (Cheng & Chan, 2006). This tradition, rooted in the Confucian value of filial piety, mandates children's duty to care for their older parents. However, this deep-rooted tradition is gradually eroding due to demographic and socioeconomic transitions over the past decades, making it difficult to rely on family support in the future. On the one hand, the aged population is increasing disproportionately. The "one-child" policy has led to the so-called "4-2-1" family structure, where two adult children need to support four older parents. On the other hand, women have been increasingly participating in the labor market, combined with the large-scale labor migration due to economic development (Xiao & Asadullah, 2020; S. Yang et al., 2022). Although institutionalized care has developed rapidly during the past decades, it remains limited and costly, and is often perceived to be associated with abuse, loneliness, social isolation, and a lack of filial care (Lapane et al., 2022; J. Liang & Marier, 2017; Schiamberg et al., 2011). Moreover, most older people prefer to age in community settings, leaving many nursing home beds vacant (R. J.-A. Chou, 2010; H. Liang et al., 2023; Zhong et al., 2024). Consequently, a large number of older people are left at home with insufficient care and support resources, with a high risk of mental disorders such as depression and loneliness.

As traditional family-based support and institutionalized care are becoming increasingly challenging, a community-based integrated care system, where community-based formal and informal support is combined, has been increasingly recognized as a sustainable solution by Chinese scholars and policymakers in recent years. In addition, China has been actively aligning with the global framework of healthy aging and has promoted the "Healthy China 2030" initiative, which emphasizes social inclusion and active participation to improve health outcomes for older people (WHO, 2024). By encouraging the active participation of older people, the government aims to establish a sustainable support system with a better balance between formal and informal care. "Mutual support" has been explicitly mentioned in national policy as a creative approach to enhance community-based care systems, although detailed guidelines are not provided. Community-based initiatives, such as the rural "*Mutual Support Model*" and urban "*Timebanking Model*", have been implemented to stimulate community engagement and mutual assistance among community-dwelling older people (S. Lu et al., 2024; Y. Wu et al., 2021; Yao et al., 2022). Despite the rapid development of related programs and projects, however, there is a lack of comprehensive understanding of the mechanisms of community-based mutual support and its psychosocial impact on older people.

RESEARCH QUESTIONS

Although community-based mutual support is encouraged across countries, less is known about the mechanisms through which older people are facilitated to engage in community-based mutual support and its impact on older people. This PhD thesis therefore aims to advance the scientific understanding of community-based mutual support by investigating the mechanisms facilitating older people's participation in mutual support and its psychosocial impact on them. Specifically, this thesis takes a multi-context perspective, aiming to address the following research questions:

- How does community-based mutual support interact with family support to influence older people's psychosocial health?
- How does the reciprocity in community-based mutual support behavior influence psychosocial health among community-dwelling older people?
- What are the mechanisms facilitating community-dwelling older people to participate in mutual support through relevant community-based initiatives?
- How does the community environment interact with mutual support and ultimately influence psychosocial health among community-dwelling older people?

THESIS OUTLINE

As societies shift towards aging in place and emphasize mutual support, understanding the facilitating mechanisms of community-based mutual support and its psychosocial impact on community-dwelling older people is crucial for developing a sustainable care system. To explore the facilitating mechanisms of community-based mutual support and its role in promoting older people's psychosocial health, this thesis adopts a multi-level approach, as illustrated in Figure 1. The framework positions community-based mutual support as part of the community-based support within the broader care systems, highlighting its interactions with family and institutional support and its functioning across individual, community, and organizational levels. The overall framework for this thesis is presented in **Figure 1**.

Social participation, family financial support, and depression for Chinese older people

We start the exploration of community-based mutual support from the family support side. In the context of a more traditional care system, where older people substantially rely on their families, **Chapter 2** investigates how community-based mutual support interacts with family support and influences psychosocial health of community-dwelling older people. We focus on Chinese community-dwelling older people, as they exemplify

the family support system and can offer valuable insights into the interaction between family support and community-based mutual support.

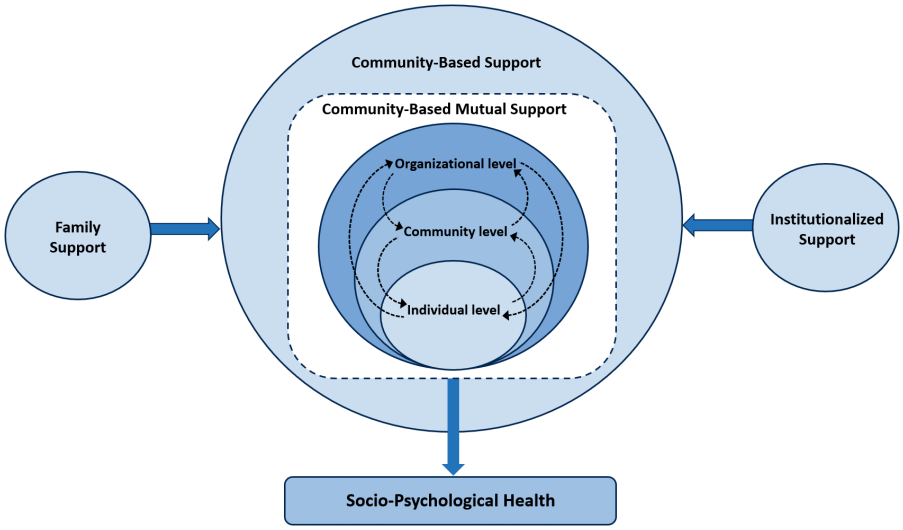

Figure 1. Framework of the thesis.

In this thesis, we investigate family support in the form of financial support from adult children. Although community participation is advocated across contexts, financial reassurance is required for active participation. Financial strains limit older people's ability to participate in social activities, as they have to continue working after retirement (Feng et al., 2020). Chinese government's social and public service expenditures have increased rapidly in the last two decades, provision of support for older people still faces substantial challenges, with pensions being a critical aspect. Compared to welfare states, China's pension system is far less developed. Traditionally, Chinese older people primarily rely on support from family members, for example, adult children (Brasher, 2022). However, personal care provided by children is becoming unsustainable in the future due to socioeconomic development and population aging. Instead, financial support from children is the primary alternative to personal care from family. It has been pointed out that support relationship between older parents and their adult children has shifted from traditional filial piety to increasing financial transfers with decreasing responsibility of personal caregiving (Liang et al., 2023). Given the importance of family support in the Chinese culture of filial piety (Brasher, 2022), as well as the increasing proportion of financial support in family support due to the immigration of adult children, we included financial support from children into account when studying community-based mutual support among Chinese older people.

It is worth noting that forms of mutual support could be largely different for Chinese older people compared to those in the West. Participation in formal volunteer groups or civic organizations, which is considered beneficial to older people in many studies based in Western countries, seems rarely to bring psychological benefits for Chinese people (Miao et al., 2019). A possible explanation is that the Chinese government has adopted restrictive legislation on the registration of social organizations, making it difficult for self-initiated organizations to gain legal status and autonomy, and therefore more difficult to generate social capital which is beneficial for older people's well-being. Therefore, in this chapter, we adopt social participation, which is a broader concept that may capture various types of mutual support, as the indicator of mutual support. Utilizing two-wave data from the China Health and Retirement Longitudinal Study (CHARLS), we will examine the association between receiving financial support from children and depressive symptoms among community-dwelling older people, emphasizing the mediating role of social participation in this relationship. By exploring how social participation can enhance the benefits of family support, this chapter provides insights into the importance of community-based mutual support for mental well-being.

Reciprocity of community-based mutual support behavior and its influence on well-being

The following Chapter places focus on the reciprocity in mutual support behavior. From the individual's perspective, mutual support refers to both giving and receiving support, both of which are important for older people's well-being. Support interactions with non-relatives, such as neighbors, can provide substantial mental benefits. Most previous studies have focused on the influence of either support giving or receiving, but few of them have considered both simultaneously (Brown et al., 2003; Djundeva et al., 2015). A limited number of relevant studies argued that giving support is better than receiving for older people's well-being, as it strengthens one's self-esteem (Brown et al., 2003; Irby-Shasanmi & Erving, 2020; Krause & Shaw, 2000; Tian, 2016). Others claim the optimal benefits come from a balance between support giving and receiving, based on the social norms of reciprocity in relationships outside the family (E. Chen et al., 2021). In general, there is scarce evidence on the impact of the balance between support giving and receiving on the well-being of community-dwelling older people, particularly in the context of non-familial relationships.

In **Chapter 3**, we investigate the impact of mutual support on the subjective well-being of community-dwelling older people, focusing on the cross-time balance between giving and receiving support with non-relatives. Specifically, we utilize three waves of longitudinal data from the large-scale database Survey of Health, Ageing, and Retirement of Europe (SHARE), measure support balance as the cross-time difference between

support giving and receiving with older people from eleven European countries, test its effect on their well-being with multiple regression analyses. This chapter aims to provide insight into the influence of reciprocity of mutual support behavior on older people, through an underexplored aspect of the support balance of giving and receiving.

Mechanisms facilitating community-based mutual support among older people

Although there is a growing interest in encouraging community-based mutual support in various countries, the mechanisms that facilitate older people's participation in it remain unclear. Providing help to others usually arises within personal networks and is driven by individual motivation. Stimulating community-dwelling older people to engage in mutual support, however, requires both individual and environmental efforts. Therefore, projects and programs aimed at stimulating mutual support in the community focus on fostering an environment where older people actively engage in giving and receiving help within their social networks.

According to the social ecological framework, individuals are embedded in contexts where multiple levels of environmental characteristics are nested (Greenfield, 2012, 2016). Older people's behavior is not only determined by their personal characteristics but also shaped by the dynamic interplay between individual and environmental factors (Greenfield, 2012). Furthermore, the concept of "community gerontology" expands on this perspective by placing it at the meso-level, represented by the community and organizational context (Greenfield et al., 2019). At the individual level, studies have mainly focused on motivations for informal support provision (Hansen & Slagsvold, 2020; Kramer et al., 2021; Same et al., 2020; Zarzycki & Morrison, 2021). These studies show that older people may be intrinsically motivated, driven by an inherent, internalized desire to help others, or extrinsically motivated by external pressures, instrumental rewards or social values (Zarzycki & Morrison, 2021). While motivation plays a crucial role, it is not sufficient on its own to stimulate supportive behavior. Although limited studies have investigated the role of other individual factors such as gender and economic status (Inagaki & Orehek, 2017; Zygouri et al., 2021), few of them have specifically focused on the mechanisms that facilitate support provision. Moreover, community-level factors are important in explaining how older people are enabled or encouraged to provide informal support to others, especially to other community members outside their families. For example, Greenfield (2016) investigated a community-based program and found that neighborhood support is strengthened by the program. A strong social network seems to be relevant, as individuals are more likely to contribute when being invited by members of their social networks (P. Lu et al., 2021). Additionally, living in a community that is safe, resourceful, and has a strong sense of community among

residents is associated with greater informal support provision (P. Lu et al., 2021). While existing studies have examined the influence of individual and community factors on informal support among community-dwelling older people, the mechanisms through which higher-level factors interact with individual-level factors to lead to support behavior remain underexplored.

Therefore, the aim of **Chapter 4** is to explore the mechanisms facilitating community-based mutual support among older people. We conducted a qualitative multiple-case study to address this research question, as it allows for in-depth, multi-faceted explorations of participants' experiences and perceptions and is appropriate for understanding the complex social phenomena that is enacted in diverse contexts (Stake, 2013). In the Netherlands, we investigated the experiences and perceptions of 23 different stakeholders across five community initiatives aimed at stimulating mutual support. Participants included older people who engaged in community-based mutual support, coordinators, as well as board members of these initiative organizations. The multi-level mechanisms identified in this chapter provide a theoretical and conceptual framework, enables us to quantitatively examine these mechanisms and their psychosocial effects, which will be further explored in the next Chapter.

Relationships between mutual support, social cohesion, and well-being

Community-based mutual support is deeply embedded in the community environment in which one lives. The results in the previous Chapter reveal multi-level mechanisms, in which social cohesion, as the indicator of the social environment of the community, plays a significant role in facilitating older people's participation in community-based mutual support. Neighborhood social cohesion is an important aspect of community dynamics. Communities with strong social cohesion enhance residents' sense of community and thus build a healthy community environment against pressure within and outside the communities. Social cohesion has been shown to be associated with a wide range of health outcomes among older people, including depression (Ruiz et al., 2018), cognitive function, and well-being (Cramm et al., 2013; Cramm & Nieboer, 2015) and so on. According to the social ecological framework, individuals are embedded in the context where multiple levels of environmental characteristics are nested (Greenfield, 2012, 2016). Living in a community with a higher level of social cohesion can facilitate relationship establishment, and strengthen the connection between individuals and the community, thereby promoting community-based mutual support. However, our findings suggest that this effect seems to be a dynamic and reciprocal process. Helping others such as volunteering was also found to promote perceived social cohesion, which in turn enhances one's motivation and opportunities to participate in mutual support (Davies

et al., 2024; Horsham et al., 2024a). These findings motivated us further to investigate the dynamic connection between social cohesion and older people's engagement with community-based mutual support, which is conceptualized as the provision of informal support to people outside the family, and their impacts on psychosocial health among older people.

In **Chapter 5**, we examine mechanisms by testing the reciprocal relationship between the participation of community-based mutual support, indicated by the provision of informal support to others outside the family, and social cohesion. Specifically, we conducted a longitudinal survey study with community-dwelling Dutch older people aged 65 and above. Questionnaires were distributed in two waves with a six-month interval. We first perform a cross-lagged analysis to examine the bidirectional relationship between informal support provision and social cohesion. We also investigate the impact of these mechanisms on older people's well-being. Additionally, mediation analysis is conducted to uncover the underlying mediating mechanisms in the paths from informal support provision (or social cohesion) to well-being through social cohesion (or informal support provision).

The thesis ends with a General Discussion in **Chapter 6**. The main research findings of this thesis are presented and briefly discussed. We then present further discussion regarding community-based mutual support. Next, methodological considerations including conceptualization considerations, methodological strength and limitations are described. Finally, recommendations for future research and practice are provided.

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CHAPTER 2

Effect of receiving financial support from adult children on depression among older persons and the mediating role of social participation

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ABSTRACT

Older people are vulnerable to depression during the aging process. Financial resources and social participation are expected to have an impact on depressive symptoms. This study investigated the relationship between financial support from children and depression among Chinese older persons, as well as the mediating effect of social participation in this relationship. Data from 7163 participants aged 60 and above were extracted from wave 2015 and 2018 of the China Health and Retirement Longitudinal Study (CHARLS). A multivariate regression analysis was performed on both cross-sectional data and two-wave longitudinal data to test our hypotheses. The results revealed that financial support from children was negatively associated with depressive symptoms in both the short-term and the long-term. In addition, this relationship was partially mediated by social participation in the short-term association and fully mediated by social participation in the long-term, where financial support was positively related to social participation, and social participation was negatively associated with depressive symptoms. This study offers an in-depth insight into the relationship between financial support from children and depression among Chinese older persons. Policies and initiatives to stimulate social participation should be promoted to improve older persons' mental health.

INTRODUCTION

Population aging is one of the most important medical and socioeconomic challenges worldwide. According to China's seventh census in 2020, the population of people aged 60 and above was 264.2 million, which accounts for 18.70% of the total population (*Tabulation on the Population Census of China*., 2010). Depression is a common mental disorder for older persons that is becoming an important issue along with accelerated aging. According to a recent study based on an investigation of 22 locations in China, over 17% of males and 23% of females aged 60 and above were found to have depressive symptoms (Y. Chen et al., 2021). It has been reported that the disease burden caused by depression is increasing: the burden in 2016 was 1.7 times higher than that in 2000 (X. Wang et al., 2022). Depression harms the quality of life, reduces life satisfaction, and even increases the incidence of suicide (Chu et al., 2019). Research suggests that financial resources and social participation are important factors explaining depression (Guan et al., 2022; Sibalija et al., 2020). We expect that the financial support of adult children, as an expression of filial piety, is important in alleviating financial stress and helps to stimulate social participation, thereby having a positive effect on the mental health of Chinese older persons.

Financial Support and Depression

Studies have shown that financial stress is a strong predictor of depression among older adults (Guan et al., 2022; Viseu et al., 2018). For example, recent studies conducted during the COVID-19 period found that financial strain is significantly associated with more depressive symptoms (Ettman et al., 2021; Hertz-Palmor et al., 2021). Although the economy has grown rapidly in China, not everybody benefits equally, and inequality is increasing (Feng et al., 2012). Poverty is still prevalent among Chinese older persons, and even those who receive a pension can often only meet their basic needs. As a consequence, many older persons, especially those in rural areas, have to continue working to sustain themselves (Gruijters, 2017). The low incomes expose them to high levels of stress and lead to poor psychological health, especially in the face of possible life crises (K. L. Chou & Chi, 2001).

Social support was found to be a positive factor for depression in later life (Mohd et al., 2019). Economic support such as pensions was found to improve depression through a change of lifestyle, increasing health investments, and economic security due to reduced financial hardship (X. Chen, Eggleston, et al., 2019). If individuals receive practical and emotional support from their social network, they will be more effective in utilizing their resources and be less prone to suffer from physical and psychological issues

(Viseu et al., 2018). In the network of social support, support from family was rated to be more important than other types of support, such as support from community and government (Ren & Lu, 2021). Financially speaking, receiving support from adult children may alleviate financial stress, improve nutrition and enable older persons to cope better financially with setbacks (P. Xu et al., 2019).

There are different opinions on the impact of financial support from children on older persons (Brasher, 2022; Litwin, 2010; Silverstein et al., 2013). Some believe that receiving financial support creates a sense of guilt and feelings of being useless because older persons may feel that they are a burden to their children. Studies in several European Mediterranean countries, for example, found no positive associations between receiving money and mental health for older persons. It was, therefore, suggested that receiving money from children is accompanied by a sense of shame in Mediterranean culture (Litwin, 2010). Some others, however, believe that financial support from adult children improves older persons' quality of life and helps them obtain a sense of safety, which reduces the risk for depression. It is common for adult children to provide financial assistance to their older parents in more traditional societies and cultures. Arab older persons are more likely to receive financial support from children, and this is associated with greater positive effects, such as well-being, than in the case of Jewish older persons. This shows that culture is an important force in predicting what type of intergenerational support is expected and accepted (Silverstein et al., 2013). Chinese children are expected to support their older parents and ensure their basic living needs as an expression of filial piety. The traditional value of filial piety in China contains a series of expected duties of children, including respect, obedience, loyalty, material provision and physical care to their parents (Zhan & Montgomery, 2003). Studies show that providing material support, including financial support, to older parents is one way to demonstrate filial piety (Brasher, 2022), and older persons who are satisfied with their children's filial piety reported a higher level of psychological comfort (Cheng & Chan, 2006). Although studies have shown that family support has a significant impact on mental health, few studies have explored the specific role of financial support from children (Choi et al., 2020; Shu et al., 2021). The first aim of this study is, therefore, to investigate the relationship between financial support that older persons receive from adult children and mental health.

Hypothesis 1.
The financial support that older persons receive from adult children will be positively associated with their mental health, as indicated by a negative relationship between the lack of financial support with a high occurrence of depressive symptoms.

Social Participation and Depression

Social participation is broadly defined as 'the conscious and active engagement in outdoor social activities leading to interacting and sharing resources with others, and personal satisfaction resulting from that engagement' (Aroogh & Shahboulaghi, 2020). It is believed to play a key role in improving mental health for urban and especially rural older persons (Dahan-oliel et al., 2008; Lampinen et al., 2006; Sun & Lyu, 2020). According to activity theory, older persons have the same psychological and social needs as middle-aged individuals. Consequently, as they withdraw from society, older individuals may experience a loss of well-being, low self-esteem and isolation. Therefore, older persons are more likely to achieve successful aging if they continue to be active after retirement (Lemon et al., 1972). Productive roles are expressed through participation in different social activities. For example, playing mahjong or cards and enjoying sports, social clubs and interacting with friends are associated with fewer depressive symptoms for Chinese urban older persons (R. Wang et al., 2019). Evidence from European countries has shown that social participation behavior such as participation in religious organizations, volunteering and altruistic behavior are beneficial for older persons' mental health (Anderson et al., 2014; Corrêa et al., 2019; Croezen et al., 2015; Von Bonsdorff & Rantanen, 2011). Based on these findings, we pose the following hypothesis:

Hypothesis 2.
Participating in social activities will be positively associated with older persons' mental health; specifically, a higher level of social participation will be associated with fewer depressive symptoms.

Financial Support, Social Participation and Depression

Social participation is influenced by the resources that one possesses. According to continuity theory, individuals experience withdrawal during the process of aging. As an adaptive strategy, older adults attempt to make use of available resources to preserve and maintain a sense of continuity and stability and maintain their social roles. As individuals' resources and abilities increase, their ability to continue in social roles increases (Atchley, 1989). Older persons with high socioeconomic status and corresponding resources can maintain previous social roles much more easily than those lacking socioeconomic status and resources (Covey, 1981). Mood (2016) found that poverty negatively influenced social participation among Swedish adults. Similarly, Feng (2020) found that older persons from a higher-income group were almost two times more likely to participate in social activities than those from a lower-income group. As an expression of filial piety, financial support from adult children is an important economic

resource for Chinese older persons, especially for those with a lower economic status. Although research has been conducted on the relationship between socioeconomic position and social participation, there is still no study on how receiving financial support from adult children affects older persons' social participation behavior. We expect that older persons who receive financial support from adult children experience less financial stress, which allows them to participate more in social activities, as more leisure time and means are available. The third hypothesis is, therefore:

Hypothesis 3.
Financial support from adult children will be positively associated with the intensity of social participation of the older persons.

It has been claimed that financial stress may affect depression through social pathways (Guan et al., 2022). Studies found, for example, that the burden of depressive symptoms due to financial strain in earlier life may be attenuated by social engagement in later life (Triolo et al., 2020). However, whether social participation also impacts the relationship between depressive symptoms and financial status in later life is unknown. We expect that financial support from children may not only alleviate the financial stress of Chinese older persons whose pension level is still relatively low, but also allow older persons to spend more time on social activity, which satisfies their need to connect to society, reduces the risk of social isolation, and finally, prevents depression. Based on the foregoing arguments, we pose our final hypothesis:

Hypothesis 4.
Social participation mediates the relationship between received financial support and mental health among Chinese older persons. Specifically, receiving more financial support from children is related to higher levels of social participation, and a higher level of social participation is further related to lower levels of depression.

MATERIALS AND METHODS

Data Source and Sample

The data in the present study are derived from the China Health and Retirement Longitudinal Study (CHARLS), which is conducted by the National School of Development (China Centre for Economic Research) of Beijing University and contains a nationally representative sample of Chinese adults aged 45 years old and above and their spouses. The response rate was high at 87.15% in wave 2015 and 86.46% in wave 2018 (Zhao et al., 2014, 2020). The PPSS (probability-proportional-to-size sampling) and CAPI

technology (computer-assisted personal interviewing) were adopted to randomly collect multistage samples (county/district-village/community-household) (Zhao et al., 2020). The baseline wave survey was conducted in 2011 and includes over 17,500 individuals in 150 counties/districts and 450 villages/resident committees from 28 provinces in China. The follow-up waves of the survey are conducted every two years, and data is made public one year after the end of data collection.

Data from 2015 and 2018 were used in the present study. We restricted our attention to respondents aged 60 and above and those who had records both in wave 2015 and wave 2018. Respondents who had missing values in the key variables of financial support, social participation and depressive symptoms were excluded. Finally, 7163 older persons were selected for the analysis (**Figure 1**).

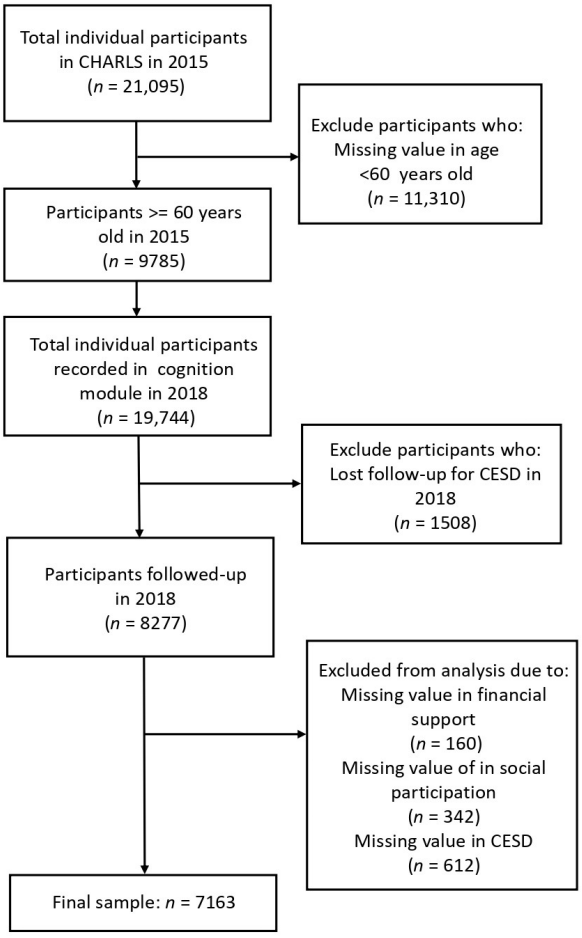

Figure 1. Flow chart of sample selection.

CHARLS obtained approval for interviewing the respondents and collecting data from the Biomedical Ethics Review Committee of Peking University (IRB00001052-11015), and the respondents were asked to sign informed consent forms. Hence, additional ethics approval was not needed.

Measurements

Depressive Symptoms

Depressive symptoms in both 2015 and 2018 were measured using the 10-item Center for Epidemiological Studies Depression (CES-D) scale (Roadolff, 1977). This scale has been shown to have good reliability and validity among community-residing older adults (Cronbach's alpha = 0.81) (Boey, 1999) as well as in this study (Cronbach's alpha = 0.80). Invdividuals were asked about the frequency of depression-related feelings and behaviors during the last week with four options available on 10 depressive symptom-related questions (0 = Rarely or none of the time, 1 = Some or a little of the time, 2 = Occasionally or a moderate amount of the time, 3 = Most or all of the time). Answers to all the items were summed up, producing a score ranging from 0 to 30. The higher the scores are, the more depressive symptoms a participant has.

Social Participation

The indicator of social participation was obtained through two questions. First, "Have you done any of these activities in the last month?" with 12 available options: (1) interacted with friends; (2) played mahjong, played chess, played cards, or went to the community club; (3) provided help to family, friends, or neighbors who did not live with you; (4) went to a sport, social, or other kinds of club; (5) took part in a community-related organization; (6) engaged in voluntary or charity work; (7) cared for a sick or disabled adult who did not live with you; (8) attended an educational or training course; (9) stock investment; (10) used the internet; (11) other; and (12) none of these. Participants who answered 'yes' for the first 11 questions were then asked about the attending frequency for each social activity in the last month. The answers were as follows: (1) almost daily; (2) almost every week; and (3) not regularly. We reverse-coded the answers and included participants who had never attended any type of activity. Hence, the code of frequency for each social activity was 0 (never); 1 (not regularly); 2 (almost every week); and 3 (almost daily); and the frequency of each activity was summed to produce the score of social participation intensity; a higher score indicates a higher level of social participation.

Financial Support

The variable financial support includes two categories, economic transfers and in-kind transfers from non-coresident children in the past year. Economic transfers include living expenses such as water, electricity, telephone rates and loans, and other regular and irregular costs. In-kind transfers include food, clothes, and other regular and irregular material support. All transfers were calculated in Chinese Renminbi Yuan (CNY 7 = USD 1). The sum value of all children's support for financial and in-kind transfers was calculated, and the logarithm of the sum was taken, the same as in related studies (F. Wu, 2021; Y. Wu et al., 2018).

Covariates

Three categories of covariates were controlled. First, we included demographic factors that have been shown to have impacts on depression and social participation (M. Guo et al., 2017; W. Lin, 2017), including age (continuous variable), gender (1 = male, 0 = female) and marital status (1 = married, 0 = others). Education level was coded as lower (lower than elementary school) and higher (elementary school and above). The registration information of Chinese citizens could be determined according to their living place and hukou. Hukou refers to the household registration system that assigns each citizen an agricultural or non-agricultural status. This affects the resources available to them including housing, employment, education and healthcare services (M. Yang et al., 2018). For example, residents with an urban hukou have a higher reimbursement of inpatient visit and medical treatment (L. W. Li et al., 2016; Zhang et al., 2017). Taking this into account, we controlled for both living areas (1 = rural, 0 = urban) and hukou status (agricultural hukou/non-agricultural hukou) as the type of residence. Since the questionnaire only asked about the financial support from non-coresident children, we also controlled for whether respondents live with children (yes = 1, no = 0). Socioeconomic factors were also included. Work status is a dichotomous variable that indicates whether participants are currently working (1 = yes, 0 = no). Although many studies used household consumption as a socioeconomic factor, it may be partially overlapped with our independent variable. Given that studies indicate pension as a significant financial factor that influences older adults' mental health (X. Chen, Wang, et al., 2019; F. Wang & Zheng, 2021), the logarithm of yearly total pension income (continuous variable) was controlled to specifically test the effect of intergenerational financial support. Previous studies have shown that a significant factor of mental health is health status (Achdut & Sarid, 2020). In our study, the ability of daily living (ADL) limitations was coded as 1 if respondents had limitations for at least one of the following activities: dressing, bathing, eating, getting into or out of bed, using the toilet, and controlling urination and defecation. Chronic disease was coded as 'yes' if respondents reported having any of the following diseases: hypertension, dyslipidemia, diabetes or

high blood sugar, cancer or malignant tumor, chronic lung diseases, liver disease, heart disease, stroke, kidney disease, stomach or other digestive diseases, emotional/nervous/psychiatric problems, memory-related disease, arthritis and asthma. Finally, self-rated health (SRH) was evaluated by asking respondents how they would rate their health status on a 5-point Likert scale: 1 = very good, 2 = good, 3 = fair, 4 = poor and 5 = very poor. In accordance with previous studies, we set the cut-off point at 3 and made it a dichotomous variable; scores of 1 or 2 were classified as 'good', while others were grouped as 'poor' (good = 1, poor = 0) (W. Li et al., 2021). Finally, to exclude the effects of the dependent variable itself across time, we also included depressive symptoms in 2015 as covariates in the long-term analysis.

Statistical Analysis

A descriptive statistical analysis was conducted before running the regression. The multicollinearity test among independent variables shows that the variance inflation factor (VIF) was between 1.02 and 1.89, and the tolerance value was greater than 0.76. This is well within the acceptable range, indicating that no multicollinearity exists between the independent variables. Bivariate correlation analyses were conducted to test the associations between variables. To test our hypotheses, we performed a cross-sectional analysis based on data from 2015 and a two-wave longitudinal analysis using data from 2015 and 2018. In the longitudinal analysis, the independent variable and mediator were extracted from wave 2015, considering that receiving resources is more likely to impact social participation in a relatively short period of time (Herbolsheimer et al., 2021). Depression symptoms in 2018 served as a dependent variable, and those in 2015 were included as one of the covariates. This allowed us to test the short-term and long-term effect of financial support on depressive symptoms as well as the mediating effect of social participation. Meanwhile, the cross-wave analysis provides stronger evidence of a causal relationship. As shown in **Figure 2**, except for exploring the total effect of financial support on depressive symptoms (path c), we tested unstandardized regression coefficients for path a (path from financial support to social participation); path b (from social participation to depressive symptoms); the direct effect of financial support on depressive symptoms (path c); and their indirect effect after controlling for social participation using bootstrapping procedures.

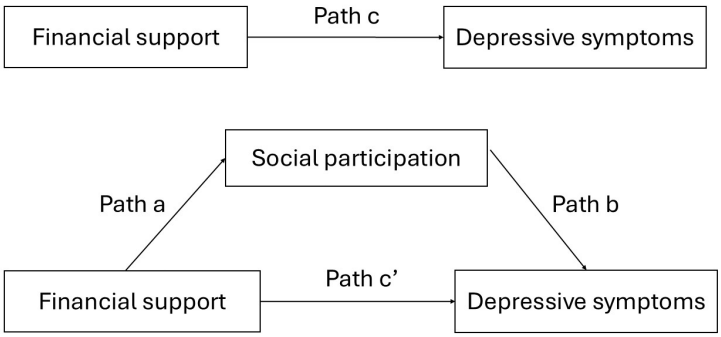

Figure 2. Conceptual framework of the present study.

Multivariate regression and mediation analyses were conducted with the support of PROCESS 4.0 (Hayes, 2017). The bootstrapping procedure was shown to overcome the limitations of Baron and Kenny's causal steps approach and Sobel's test and was less affected by the sample size and the distribution of samples. It was also able to produce more accurate results (Preacher & Hayes, 2008). In this study, each of the 5000 bootstrap samples was used to test the mediating effect, as in other studies (Kochli-Hailovski et al., 2021; P. Xu et al., 2019). Bias-corrected 95% confidence intervals (CIs) were used to investigate the mediation effect, and the mediating effect was considered significant if 0 was not located in the CI range. All of the covariates identified above were included in these analyses. We used multiple imputations by chained equations (MICE) to impute missing values for covariates. All analyses in this study used R software package, version 4.1.2 (Team & Al., 2016). Multiple imputations for missing data were performed by using the 'mice' package, and a mediation analysis was performed by PROCESS in R, which was developed by Hayes. $p < 0.05$ was considered statistically significant.

RESULTS

Sample Description

The demographic characteristics of all participants are presented in **Table 1**. The average age of the participants was 67.36 years old (SD = 6.00); 48,8% of the respondents were male, and most (82%) of the respondents were married. Over half (52.5%) of the respondents had a lower education level. Although there was a slight difference, the respondents lived in rural areas or had an agricultural hukou account for about 75% of the total sample, which indicates the reliability of both variables. A total of 72.5% of the respondents had at least one kind of chronic disease, while over 70% of them did not have any ADL limitations, and nearly 90% of them reported good health status. The average amount of financial support from children was 3.01 (SD = 1.31), more than the amount

of pension that the respondents received, which was 2.31 (SD = 1.60). The strength of social participation was 1.65 (SD = 2.22). The mean value of the CES-D score was 8.24 (SD = 6.50) in 2015 and 8.75 (SD = 6.60) in 2018.

Bivariate Relationship among Key Variables

A bivariate correlation analysis was performed to test the relationship between the variables. As presented in **Table 2**, the results showed that financial support was positively associated with social participation ($r = 0.05$, $p < 0.001$) but not significantly associated with depressive symptoms in 2015 ($r = -0.02$, $p > 0.05$) and 2018 ($r = -0.02$, $p > 0.05$). Social participation is negatively associated with depressive symptoms in both 2015 ($r = -0.13$, $p < 0.001$) and 2018 ($r = -0.12$, $p < 0.001$). It is notable that both living area and hukou had a relatively strong correlation with key variables with similar coefficients. Specifically, respondents who lived in urban areas or had a non-agricultural hukou received a higher level of financial support ($r = 0.08$, $p < 0.001$ for both variables). Similarly, social participation intensity was higher for those who lived in urban areas ($r = -0.21$, $p < 0.001$) or had non-agricultural hukou. Finally, living in a rural area or having an agricultural hukou was positively related to depressive symptoms in 2015 ($r = 0.14$, $p < 0.001$ for both variables); similar patterns were also found in 2018 ($r = 0.12$, $p < 0.001$ for living area, $r = 0.14$, $p < 0.001$ for hukou). These results indicate significant relationships between variables, although the strength of the correlation is weak.

Cross-Sectional Mediating Effect

We first tested the relationship between financial support, social participation and depressive symptoms with one-wave data. In this analysis, all variables were extracted from wave 2015. The results are indicated in **Table 3**. After controlling all covariates, the result in path c showed that financial support was negatively associated with depressive symptoms ($\beta = -0.20$, $p < 0.001$). Financial support had a positive association with the intensity of social participation ($\beta = 0.12$, $p < 0.001$), indicating a beneficial role of receiving financial support from children in social participation. Meanwhile, social participation showed a negative association with depressive symptoms ($\beta = -0.20$, $p < 0.001$), while controlling financial support. The mediation analysis showed a significant indirect effect of social participation, revealing a mediating role of social participation on the relationship between financial support and depressive symptoms ($\beta = -0.02$, 95% CI [−0.04, −0.02]). In addition, the direct effect of financial support on depressive symptoms weakened but stayed significant after accounting for the mediator ($\beta = -0.18$, 95% CI [−0.28, 0.07]).

Table 1. Sociodemographic characteristics (N = 7163)

Variables	N (%)	Mean (SD)	Range
Age		67.36 (6.00)	60 – 93
Gender			
Male	3501 (48.88)		
Female	3662 (51.12)		
Marital status			
Married	5914 (82.56)		
Not married	1249 (17.44)		
Living area			
Rural	5258 (73.40)		
Urban	1905 (26.60)		
Hukou			
Agricultural hukou	5576 (77.84)		
Non-agricultural hukou	1587 (22.16)		
Whether coresident with children			
Yes	3529 (49.27)		
No	3634 (50.73)		
Education			
Lower	3762 (52.52)		
Higher	3401 (47.48)		
Work status			
Yes	4058 (56.65)		
No	3105 (43.35)		
Pension income (log scale)		2.31 (1.60)	0 – 5.46
Ability of daily living limitation			
Yes	1729 (24.24)		
No	5434 (75.86)		
SRH			
Good	6374 (88.99)		
Poor	789 (11.01)		
Whether have chronic disease			
Yes	5185 (72.39)		
No	1978 (27.61)		
Depressive symptoms (2015)		8.24 (6.50)	0 – 30
Financial support (log scale)		3.01 (1.31)	0 – 5.88
Social participation		1.65 (2.22)	0 – 15
Depressive symptoms (2018)		8.75 (6.60)	0 – 30

Generally speaking, these results showed a partial mediating effect of social participation in the short-term relationship between received financial support and depressive symptoms. That is, financial support positively affects depressive symptoms directly and via social participation, meaning that it positively influences social participation, and social participation, in turn, negatively affects depressive symptoms.

Longitudinal Mediating Effect

We also tested the mediating relationship with longitudinal data. The results are shown in **Table 4**. In path c, financial support in 2015 negatively affected depressive symptoms in 2018, although the effect size has decreased ($\beta = -0.10$, $p < 0.05$). Similar to the results in the previous analysis, financial support positively affected social participation ($\beta = 0.19$, $p < 0.001$). Social participation in 2015 had a negative association with depressive symptoms in 2018 ($\beta = -0.09$, $p < 0.01$), while controlling financial support and depressive symptoms in the past (2015). The mediation analysis showed a significant indirect effect of social participation and revealed a mediating role of social participation on the relationship between financial support and depressive symptoms ($\beta = -0.01$, 95% CI [−0.02, −0.004]). It is worth noting that the direct effect of financial support on two-year-later depressive symptoms became insignificant after accounting for social participation ($\beta = -0.09$, 95% CI [−0.19, 0.01]). These results indicate a full mediating effect of social participation in the long-term negative relationship between financial support and depressive symptoms. That is, financial support positively affects social participation, and social participation, in turn, negatively affects depressive symptoms.

Table 2. Correlation among variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	1															
2. Gender	0.03***	1														
3. Marital status	-0.26***	0.18***	1													
4. Living area	-0.02	0	0	1												
5. Hukou	-0.07***	-0.07*	-0.02*	0.64***	1											
6. Co-residence	-0.06***	-0.01	-0.08***	0.02*	0.08***	1										
7. Education	-0.06***	0.32***	0.11***	-0.27***	-0.33***	-0.05***	1									
8. Work	-0.27***	0.13***	0.14***	0.34***	0.34***	0.02	-0.09***	1								
9. Pension	0.13***	0.05***	0	-0.15***	-0.19***	-0.05***	0.11***	-0.09***	1							
10. ADL limitation	0.12***	-0.1***	-0.07***	0.07***	0.07***	0	-0.12***	-0.1***	-0.02	1						
11. SRH	0.03**	-0.04***	-0.02	0.03*	0.02	0.03*	0	-0.03**	0.01	0.13***	1					
12. Chronic disease	0.04**	-0.06***	-0.01	0.04***	0.04***	-0.02	-0.05***	-0.04***	-0.01	0.13***	0.13***	1				
13. Depressive symptoms (2015)	0.01	-0.19***	-0.11***	0.14***	0.14***	0.04***	-0.18***	0.01	-0.05***	0.33***	0.19***	0.15***	1			
14. Financial support	0.04**	-0.03*	0	0.08***	0.08***	-0.02	-0.04**	0.02	0.02	0.03*	-0.01	0.05***	-0.02	1		
15. Social participation	-0.02*	0.02	-0.02	-0.21***	-0.23***	-0.03**	0.19***	-0.13***	0.12***	-0.06***	-0.06***	-0.02	-0.13***	0.05***	1	
16. Depressive symptoms (2018)	-0.01	-0.18***	-0.07***	0.12***	0.14***	0.03**	-0.18***	0.03**	-0.08***	0.25***	0.16***	0.14***	0.52***	-0.02	-0.12***	1

Notes. ADL = activities of daily living; SRH = self-rated health.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3. Cross-sectional mediating effect of social participation in the association between financial support and depressive symptoms.

Variables	Path c				Path a				Path b/c'			
	B	SE	LLCI	ULCI	B	SE	LLCI	ULCI	B	SE	LLCI	ULCI
Age	-0.04**	0.01	-0.06	-0.01	-0.02***	0.00	-0.03	-0.01	-0.04***	0.01	-0.07	-0.02
Gender	-1.40***	0.15	-1.70	-1.10	-0.09	0.05	-0.20	0.02	-1.42***	0.15	-1.71	-1.12
Marital status	-1.16***	0.19	-1.55	-0.78	-0.28***	0.07	-0.42	-0.15	-1.22***	0.19	-1.60	-0.84
Living area	0.76***	0.21	0.35	1.17	-0.35***	0.08	-0.50	-0.20	0.69**	0.21	0.28	1.10
Hukou	0.78***	0.23	0.34	1.23	-0.65***	0.08	-0.81	-0.48	0.65**	0.23	0.21	1.10
Co-residence	0.17	0.14	-0.11	0.44	-0.07	0.05	-0.17	0.03	0.16	0.14	-0.12	0.43
Education	-0.96***	0.16	-1.27	-0.65	0.55***	0.06	0.44	0.66	-0.85***	0.16	-1.16	-0.54
Work	0.15	0.16	-0.16	0.46	-0.24**	0.06	-0.36	-0.13	0.10	0.16	-0.21	0.41
Pension	-0.05	0.04	-0.14	0.04	0.10***	0.02	0.07	0.13	-0.03	0.04	-0.12	0.06
ADL limitation	4.23***	0.17	3.90	4.56	-0.14*	0.06	-0.26	-0.02	4.21***	0.17	3.88	4.53
SRH	2.75***	0.23	2.31	3.19	-0.36***	0.08	-0.52	-0.20	2.68***	0.23	2.24	3.12
Chronic disease	1.24***	0.16	0.93	1.55	0.02	0.06	-0.09	0.13	1.24***	0.16	0.93	1.55
Financial support	-0.20***	0.05	-0.31	-0.10	0.12***	0.02	0.09	0.16	-0.18***	0.05	-0.28	-0.07
Social participation									-0.20***	0.03	-0.27	-0.14
Constant	7.97***	0.97	6.07	9.86	3.85***	0.35	3.16	4.53	8.74***	0.97	6.83	10.65
R^2	0.19				0.09				0.19			

Notes. ADL = activities of daily living; SRH = self-rated health.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4. Longitudinal mediating effect of social participation in the association between financial support and depressive symptoms.

Variables	Path c				Path a				Path b/c'			
	B	SE	LLCI	ULCI	B	SE	LLCI	ULCI	B	SE	LLCI	ULCI
Age	-0.02	0.01	-0.04	0.01	-0.02***	0.00	-0.03	-0.01	-0.02	0.01	-0.04	0.00
Gender	-0.89***	0.14	-1.17	-0.60	-0.13*	0.06	-0.24	-0.02	-0.90***	0.14	-1.18	-0.62
Marital status	-0.14	0.18	-0.50	0.22	-0.31***	0.07	-0.45	-0.18	-0.17	0.18	-0.53	0.19
Living area	0.22	0.20	-0.17	0.61	-0.31***	0.08	-0.46	-0.16	0.19	0.20	-0.20	0.58
Hukou	0.27	0.21	-0.15	0.69	-0.65***	0.08	-0.81	-0.49	0.21	0.22	-0.21	0.63
Co-residence	0.10	0.13	-0.16	0.36	-0.06	0.05	-0.16	0.04	0.09	0.13	-0.17	0.35
Education	-0.69***	0.15	-0.98	-0.40	0.52***	0.06	0.41	0.64	-0.65***	0.15	-0.94	-0.35
Work	0.40**	0.15	0.11	0.70	-0.25***	0.06	-0.36	-0.13	0.38*	0.15	0.08	0.67
Pension	-0.13**	0.04	-0.21	-0.04	0.10***	0.02	0.07	0.13	-0.12**	0.04	-0.20	-0.03
ADL limitation	1.23***	0.16	0.91	1.56	-0.03	0.06	-0.15	0.09	1.23***	0.16	0.91	1.56
SRH	1.14***	0.21	0.72	1.56	-0.29***	0.08	-0.45	-0.13	1.12***	0.21	0.70	1.54
Chronic disease	0.71***	0.15	0.41	1.00	0.05	0.06	-0.06	0.17	0.71***	0.15	0.42	1.00
Depressive symptoms (2015)	0.46***	0.01	0.43	0.48	-0.03***	0.00	-0.03	-0.02	0.45***	0.01	0.43	0.47
Financial support	-0.10*	0.05	-0.20	-0.01	0.19***	0.02	0.08	0.16	-0.09	0.05	-0.19	0.01
Social participation									-0.09**	0.03	-0.15	-0.03
Constant	5.19***	0.91	3.39	6.98	4.07***	0.35	3.38	4.75	5.55***	0.92	3.74	7.36
R^2	0.30			0.30					0.30			

Notes. ADL = activities of daily living; SRH = self-rated health.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

DISCUSSION

This study contributes several important findings toward understanding the relationship between intergenerational financial support and depression among Chinese older persons. First, our results suggest that receiving financial support and social participation leads to fewer depressive symptoms in both the short and long term. Importantly, we found a partial mediating effect of social participation in the short-term relationship between financial support and depressive symptoms, and this partial mediation turned into full mediation in the long-term relationship between financial support and depressive symptoms. In other words, receiving financial support from adult children is beneficial for social participation, and social participation, in turn, alleviates depressive symptoms.

We found a significant negative impact of financial support from children on both short-term and long-term depressive symptoms among Chinese older persons, which confirmed our first hypothesis. This is in line with the finding of (Y. Wu et al., 2018) that receiving financial support from children is mentally beneficial for older parents, although this study took household expenditure as the proxy of economic status that may incorporate different types of income, including pension, which is the largest source of income inequality among older-person households in China (J. Li et al., 2020). Our finding indicates that financial resources, particularly from adult children, may alleviate the financial stress of older persons and, thus, decrease their depressive symptoms. This suggests that the beneficial effect of intergenerational financial support is relevant in the short and long run. It is notable that in recent years, children's obligation to their parents has been redefined as the processes of fast industrialization and urbanization have occurred. Although there is a positive influence of intergenerational financial support, there is also a downside. Some studies in Chinese communities such as Hong Kong and Singapore found that financial support sometimes creates feelings of being a burden and results in excessive guilt and shame among older persons, similar to findings in other developed countries (Ng et al., 2002; Shiraz et al., 2020). In addition, the development of new communication technology enables adult children to provide emotional support to their older parents without living nearby. Future studies are needed to update the meaning of financial support to Chinese older persons in terms of both financial and cultural dimensions.

Consistent with our second hypothesis, we found a negative impact of social participation on both short-term and long-term depressive symptoms. This result is consistent with previous findings that social participation leads to better mental health and participating in social activities consistently promotes individuals' well-being in later life (Walsh et al., 2017). This finding supports the activity theory of aging that through interacting with friends as well as other social activities, older persons build social engagement and share

resources with others, which helps them to receive more socio-emotional support, and thus, improves their mental health (Adams et al., 2011).

Finally, we found a mediating role of social participation in the relationship between financial support and depressive symptom, confirming our Hypothesis 3 and 4. This seems to be in line with other findings that social participation mediates the relationship between socioeconomic status and mental health (Achdut & Sarid, 2020). Sufficient financial resources allow individuals to spend more time and energy participating in various social activities. Activities such as playing mahjong, attending an educational course, online shopping, and even simply interacting with friends are all leisure activities that require financial or time investment. Other studies also found that income and pension positively influence the social engagement of older persons (Feng et al., 2020; Zhu & Walker, 2019). However, Feng (2020) did not differentiate between different sources of income, and Zhu (2019) only focused on pension income. Our study showed that even after controlling for pension income, the financial support from adult children still has a positive effect on social participation, emphasizing the beneficial effect of intergeneration financial resources. The results of the cross-sectional analysis showed a partial mediating role of social participation as well as a significant direct effect of financial support and depression. This suggests that financial support benefits mental health not only by decreasing individuals' financial stress, but also by stimulating social participation. Interestingly, this partial mediating effect turned into full mediation in the long-term impact of financial support on depressive symptoms. A likely explanation for this is that financial support may reduce the financial stress of older persons and thereby improve their psychological well-being for a certain period. However, this direct benefit may deteriorate over time after the money is spent. In contrast, as an adaptive strategy for older persons to maintain their previous social roles, participating in social activities helps individuals to connect to their social networks and may prevent them from social isolation over a longer period of time (Santini, Jose, York Cornwell, et al., 2020). Hence, it is no longer the physical benefits or sense of financial safety that influences depressive symptoms in older persons, but rather the behavior of social participation that financial support facilitates, which is consistent with the continuity theory (Atchley, 1989). Generally, both the results in the short term and long term suggest that social participation is important for Chinese older persons for alleviating depression.

It should be noted that the present study took the intensity of all types of social activities that older persons attended as the indicator of social participation without testing the separate effects of each form of social participation. Research has found that older persons in a Western cultural context are more likely to engage in social activities independently, such as volunteering, than take part in activities with high involvement

with others. Eastern cultures may prefer to interact with friends and depend on each other, given that the core unit of survival is the group (Duppen et al., 2020; Hui & Yee, 1994). In recent times, Internet use has become a popular form of social participation for older persons, and activities such as chatting with friends or shopping online are widely replacing traditional social activities (Srivastava & Panigrahi, 2019; J. Wang et al., 2020). Therefore, different types of social participation may have different impacts on the health outcome of older persons across cultures. Further studies could be performed to explore the specific role of different forms of social participation on the relationship between intergenerational financial support and mental health.

Limitations

Several limitations should be noted in this study. First, although financial support from family members and pensions are important financial sources for Chinese older persons, not all income sources, such as other earnings, were included. Future studies could be performed to test the specific role of different financial resources on mental health among older persons. Additionally, living area and hukou are outstanding covariates in our result, indicating that the resident place and hukou status are significant factors of financial support, social participation and depressive symptoms of older persons. Many previous studies found rural–urban disparity in health-related behavior and health outcomes among older persons. For example, the prevalence of depressive symptoms is higher among older persons residing in rural areas than those living in urban areas, and the health effect of social participation is stronger for rural older persons too (Q. Guo et al., 2018; Sun & Lyu, 2020). Older persons living in rural areas have more unmet needs than those residing in urban areas, even though they comprise the majority of the aged population in China (B. Hu & Wang, 2019). Future studies could be conducted to further investigate the role of rural–urban differences in the relationship between financial support, social participation and depression among older persons, but also particularly the needs of rural older persons. Finally, although the dataset we used in this study had a high response rate (Zhao et al., 2014), the response bias still exists, since not all targeted people participated in the survey.

Implications

Despite these limitations, our study provides important signals for health-related policymakers and professionals to provide better care for older persons. We found a beneficial role of financial support on depressive symptoms among Chinese older persons both in the short and long run. It is important for policymakers to strive to improve the economic well-being of older persons and ensure they have stable financial resources.

Moreover, our study emphasized the important beneficial role of social participation in the relationship between financial support from children and depressive symptoms, and practitioners working in the community and in mental health services are encouraged to construct interventions to stimulate social participation among older persons, and thus, benefit their mental health.

Conclusions

The present study revealed that receiving financial support from adult children has a negative association with depression among Chinese older persons, although this effect diminishes over time. More importantly, social participation serves as a mediator through which financial support benefits the alleviation of depressive symptoms in both the short and long run. We suggest that, in addition to ensuring financial resources, it is even more important that policies and initiatives be proposed by policymakers and related professionals to promote social participation among older persons.

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CHAPTER 3

The Effect of long-term (im) balance of giving versus receiving support with nonrelatives on subjective well-being among home-dwelling older people

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ABSTRACT

Objectives

Although many studies have explored the benefits of support giving or receiving for older people, little is known about how the balance between giving and receiving instrumental support in non-relative relationships affects home-dwelling older people. This study examines the relationship between long-term support balance and subjective well-being in relationships with nonrelatives among older people across 11 European countries.

Methods

A total of 4,650 participants aged 60 years and older from 3 waves of the Survey of Health and Retirement in Europe were included. Support balance was calculated as the intensity difference between support received and support given across 3 waves. Multiple autoregressive analyses were conducted to test the relationship between support balance and subjective well-being, as indicated by quality of life, depression, and life satisfaction.

Results

The impact of balanced versus imbalanced support on all subjective well-being measurements was not significantly different. Compared to balanced support, imbalanced receiving was negatively related to subjective well-being and imbalanced giving was not related to better subjective well-being. Compared to imbalanced receiving, imbalanced giving showed to be the more beneficial for all subjective well-being measures.

Discussion

Our results highlight the beneficial role of imbalanced giving and balanced support for older people compared to imbalanced receiving. Policies and practices should prioritize creating an age-friendly environment that promotes active participation and mutual support among older people, as this may be effective to enhance their well-being.

BACKGROUND

As the population ages and healthcare expenditure increases, many countries are facing budget issues for paid care. This has led policy makers to advocate for an increased reliance on unpaid care, provided by those from individuals' personal network, such as relatives, friends, and neighbors (Coe et al., 2020; Stall et al., 2019). However, the disproportionate burden that family caregivers experience limits the potential of unpaid support from relatives. Utilizing support resources from non-relatives, such as neighbors and friends, has been demonstrated to facilitate aging in place and is encouraged by numerous countries (Pani-Harreman et al., 2021). While the protective effect of receiving and giving social support on health outcomes among older people has been repeatedly proven by studies, few have investigated how the balance between giving and receiving support in relationships with non-relatives affect health outcomes for older people (Hoogerbrugge & Burger, 2018; K. Lin et al., 2014; F. Wu & Sheng, 2019). In this paper, we apply the term non-relative to describe people who do not have a familial relationship with the one they support and/or receive support from. Support balance is conceptualized as the difference of instrumental support that older people have given and received to and from non-relatives, and its impact on older people's subjective well-being, as indicated by quality of life (QoL), depression, and life satisfaction, is examined based on three-waves data.

The most common categorization measuring social support is the division of emotional support and instrumental support (Mohd et al., 2019). Compared to emotional support which concerns the expression of emotion and the general need for companionship, instrumental support refers to tangible forms of assistance one receives or provides to serve more specific needs (Cohen & Wills, 1985). Studies suggest that emotional support and instrumental support may work differently and can bring various outcomes for individuals (Morelli et al., 2015). This study particularly focuses on instrumental support and conceptualizes it as practical help, including personal care, practical household help, or paperwork.

The relationship between support giving and receiving can be either balanced or imbalanced. Balanced support refers to relationship dynamics in which the amount of support given is equal to the amount received, while imbalanced support refers to the relationship in which the amount of support given and received is disproportionate (Fyrand, 2010). Social exchange theory and equity theory are the most commonly used theories in research on support balance. According to social exchange theory, individuals are rational decision makers who tend to maximize their benefits as rewards and minimize cost in interpersonal relationships (Homans, 1958). Following this idea,

individuals are expected to be most benefited when they receive more support than they give. Compared to that, equity theory claims that individuals would prefer to maintain a balance of exchanges and prefer relationships where the amount of support received and given are relatively equal, as support imbalance can cause feelings of distress, guilt, or overburden and negatively impact individuals (Fyrand, 2010; Hatfield et al., 1978).

Despite numerous findings supporting the beneficial role of balanced support on health outcomes, whether this relationship specifically applies to support between older people and their non-relatives has not been thoroughly investigated. The role of support balance should be considered within the context of different relationships over time. Because of strong existing societal norms and expectations that require relatives to help each other, relationships between close relatives are less likely to be terminated even if the support reciprocity is imbalanced (Thomas, 2010a). Therefore, balanced reciprocity cannot be fully applied in relationships between older people and close relatives. In contrast, instrumental support exchange with non-relatives, such as neighbors and friends, tends to be more in line with balanced reciprocity, given that there are less strict societal norms and expectations related to support exchange, individuals are inclined to end the relationship when they feel unsatisfied with the imbalanced exchange (T. Li et al., 2011). Some empirical studies have supported applying equity theory in understanding support balance. Wang (2019) found that the perception of support imbalance was associated with poorer psychological well-being compared to balanced support. A 23-year follow-up study found that adults who have balanced instrumental support had a lower risk of all-cause mortality than those who had imbalanced support (E. Chen et al., 2021). However, these studies did not either focus on instrumental support nor specifically on relationships with non-relatives. Based on arguments above, we propose the first hypothesis that balanced instrumental support with non-relatives will be associated with better subjective well-being than imbalanced support, indicated by higher level of quality of life, life satisfaction and a lower level of depression (**H1**).

Support exchange is considered imbalanced when the giving and receiving are not equal. According to the esteem-enhancement theory, providing support to someone and being under benefited leads to enhanced self-esteem and increased well-being. On the contrary, over-receiving support leads to negative self-evaluation and may resultantly damage health outcomes (Batson & Powell, 2003). Lack of repayment for received support may push the support recipient into a psychological state of indebtedness, threatening the individual's sense of independence, ignite feelings of guilt, and increase distress (Brown et al., 2003; Silverstein et al., 1996). Alternatively, providing support makes one feel independent and increases the feeling of self-esteem and mastery, which are particularly beneficial for the well-being of older people (Irby-Shasanmi & Erving, 2020). A lifespan perspective of social

support suggests that the impact of support varies across different age demographics (T. Li et al., 2011). Younger people tend to focus more on their self-concept and development, which makes support receiving more important, while older people focus more on their contribution to society and are more willing to help others (Uchino, 2009). Importantly, for older people, providing more support than they receive to non-relatives implies that they can still contribute to society, which enhances feelings of confidence (Conkova et al., 2018).

Evidence related to how imbalanced support in relationships with non-relatives affect older people is limited. Results from a study focusing on people with chronic mental health disorders suggested that providing peer support is more beneficial than receiving support (Bracke et al., 2008). Similarly, a study explored the effect of giving support versus receiving support on longevity in older married adults (Brown et al., 2003). Results revealed that providing instrumental support to friends, relatives and neighbors reduced the mortality risk, while receiving instrumental support from others increased the mortality risk. Importantly, giving support counterbalanced the negative effect of receiving support. However, these results did not distinguish the effect for each relationship. Thomas (2010) distinguished relationship types and found similar results for older people, although this study failed to focus on instrumental support specifically. Also, these studies measured support giving and receiving separately, none of them explored this from a balanced perspective. Based on esteem-enhancement theory, this study proposes a second hypothesis that, for imbalanced support, giving support to non-relatives will be associated with better subjective well-being compared to imbalanced receiving, indicated by higher level of quality of life, life satisfaction and lower level of depression (**H2**).

Relevance and aim

Previous research provided limited evidence about the impact of support balance on well-being among older people. To our knowledge, existing literature has not focused on the relationship between balance of instrumental support and subjective well-being in non-relative relationships for older people specifically. Moreover, existing findings are primarily based on studies that collected data at a single point in time. The concept of '*support bank*' suggests that individuals maintain a mental record of support they have received and given (Antonucci & Jackson, 1989). Support at earlier time points can be assumed to accumulate over time, similar to the accumulation of funds in a saving account, which may affect one's health outcomes in the long term. Based on this concept, it is more suitable to measure support balance over time for a long-term perspective while discussing its impact on subjective well-being. To fill in these gaps, this study aims to focus on instrumental support, investigate the relationship between social support balance with non-relatives and subjective well-being of older people.

METHODS

Data

Data from Survey of Health, Ageing and Retirement of Europe (SHARE) is used in the present study (Börsch-Supan et al., 2013). SHARE is a longitudinal community-based survey conducted biannually with computer-assisted personal interviews (CAPI) that focuses on health, well-being, socioeconomic, and social relationships among a European population aged 50 and over and their partners. The first data collection was conducted in 2004 with respondents from eleven countries and has expanded up to 27 European Union countries and Israel in wave 8 (2019). More detailed information of SHARE could be found at: https://share-eric.eu/.

Data of this study stem from wave 4 (2011), 5 (2013), and 6 (2015). We chose multiple waves to test the effect of long-term support balance. In the SHARE dataset, waves 3 and 7 are outliers, because a different set of questions were asked (related to the life history of respondents), which makes waves 4, 5, and 6 the most recent consecutive set of standard SHARE data collection. This strategy allows us to calculate cross-time balance as well as prevents inappropriate calculation that influenced by the data variation during wave 3 and wave 7 and prevents large data-gaps in calculating cross-time balance. Data of the included three waves will be respectively referred to as Time 1 (T1), Time 2 (T2), and Time 3 (T3) in the present study.

The study had five exclusion criteria. First, we excluded individuals who aged younger than 60 at wave 4. Second, individuals who did not participate in each selected wave were excluded. Third, we excluded those who did not provide answers to the social support module which contains the key variables of this study. Fourth, individuals who had never offered nor received any support from people outside their household in all three waves were excluded because support balance outside of the household was absent. In other words, those who had never received or given any support and those who only had support interaction with family members across all waves were excluded. Last, individuals who live in nursing homes were excluded from the sample. The sample selection process is summarized in **Figure 1**.

Variables construction

Independent variables

The independent variable is the long-term support balance between support that has been provided and received among older people, which is conceptually in line with previous studies (E. Chen et al., 2021; Irby-Shasanmi & Erving, 2020; T. Li et al., 2011). To get the long-term support balance indicator, we first calculated the support intensity of giving and receiving separately. Participants were asked to recall their experience of receiving and giving support to people outside the household in the past 12 months. We calculated the intensity of support receiving from non-relatives as the sum frequency ranging from 0-12 for each wave, the average frequency across three waves was calculated as the long-term intensity of receiving support. Similarly, support giving was calculated as the averaged frequency across three waves of the intensity of giving support to non-relatives. Finally, support balance was calculated as the difference between the averaged intensity of giving and receiving, that is, the waves-averaged frequency of support given minus that of support received. We created two separate categorical variables to capture (im) balance. In the first categorical variable, balanced support was coded as 0 and both negative and positive imbalance was coded as 1. In the second categorical variable, negative scores were categorized as imbalanced receiving, means more receiving than giving; 0 was categorized as balanced support, and positive scores were categorized as imbalanced giving, that is, giving more support than receiving. Variables with different categorization strategies were put into different models for analysis. The detailed calculation of independent variable is presented in Online Supplementary Material.

Dependent variables

Quality of life Quality of life was assessed using the CASP-12 scale, the abridged version of CASP-19, with good psychometric properties with good reliability and validity (Borrat-Besson et al., 2015; Lestari et al., 2021). The CASP scale was developed based on the need satisfaction theory, which posits that human beings share a common set of needs, and the extent to which these needs are fulfilled reveals the level of subjective well-being of individuals (Diener, E. & Lucas, R., 2000). 12 items in the scale measure the frequency of individuals' experienced feelings related to the four dimensions with answers ranging from 'often', 'sometimes', to 'rarely' and 'never' which were coded from 1 to 4. The sum of all twelve items was calculated as the score of CASP scale, ranging from 12 to 48. A higher score indicates better subjective well-being and quality of life (Ateca-Amestoy & Ugidos, 2013; Borrat-Besson et al., 2015). Cronbach's α in the present study was 0.79 to 0.82 from T1 to T3.

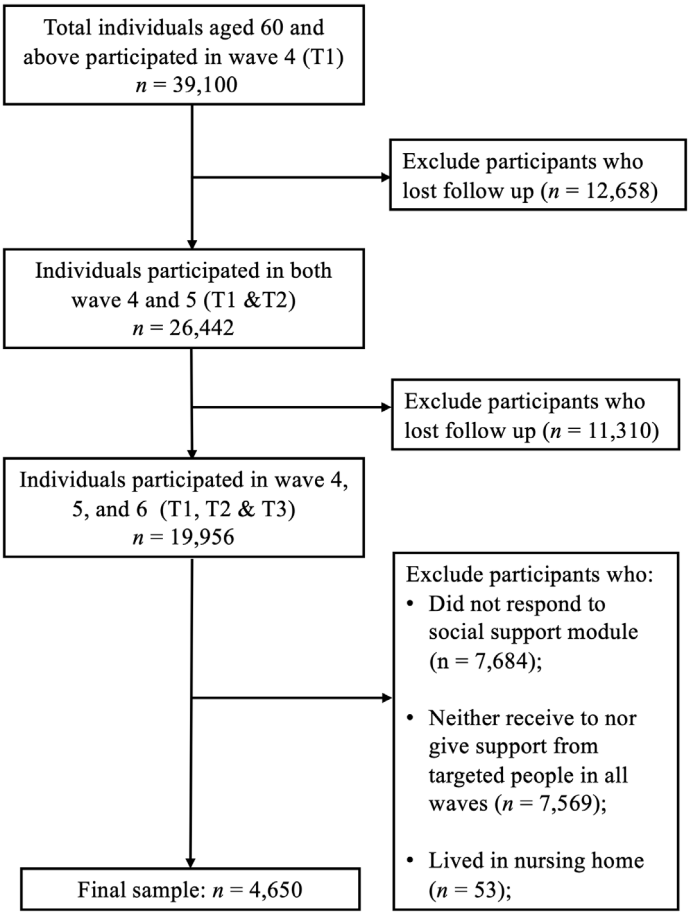

Figure 1. Flow chart of sample selection.

Depression Depressive symptoms are measured by the EURO-D scale, originally developed as a unified tool for assessing depressive symptoms across countries (Copeland; et al., 2004). The EURO-D consists of 12 items evaluating the presence of 12 depressive symptoms in the last month, including depression, pessimism, death wishes, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness. Each item is scored 0 (symptom not present) or 1 (symptom present), and item scores are summed (0-12) as the score measuring the level of depression, a higher score refers to higher level of depression. The Cronbach's alpha for samples in this study was 0.67 to 0.68 from T1 to T3.

Life satisfaction Life satisfaction is frequently used to assess the overall well-being of individuals as it allows respondents the flexibility to weight the value of specific life

domains by their own standards to assess their life satisfaction and has been shown to have adequate reliability and validity (Brandt et al., 2022). In this dataset, it was measured by individuals' responses to a single question: "On a scale from 0 to 10 where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?" Thus, higher values indicate higher life satisfaction.

Covariates

Control factors that have been shown in other studies to influence well-being were included as covariates, including demographic, socioeconomic (i.e., educational level, financial stress, employment status) and health-related factors at baseline (Barbosa et al., 2020; Lestari et al., 2020; Santini, Jose, Koyanagi, et al., 2020). Age (continuous) and gender (male/female) were controlled. Marital status was grouped as "partnered" (married/ registered partner) or "not partnered" (separated/ never married/ divorced/ widowed). Employment status was dichotomized into employed and unemployed. Eleven European countries were grouped Southern (Spain, Italy), Northern (Sweden, Denmark), Western (Germany, France, Switzerland, Belgium, Austria, and Czech Republic), and Eastern (Slovenia, Estonia) European countries (Djundeva et al., 2019). Education level was coded according to the International Standard Classification of Education (ISCED) and was classified as lower (0-2), middle (3-4) and higher (5-6). Financial factors were studied by measuring financial stress and equivalised income. The former indicator was measured by the difficulty participant have to meet their needs, answers were coded from easy to great difficulty (1-4), and the latter was measured by dividing the gross household income by the square root of household size (Angelini et al., 2019). Health was measured by self-rated health (SRH) ranging from poor to excellent (1-5), the number (0-6) of limitations respondents experience with activities of daily living (ADLs) and instrumental activities of daily living (IADLs). In addition, we also included the dependent variables in wave 4 and wave 5 in equations to build autoregressive models, given that it may provide stronger evidence for a causal relationship from a cross-time perspective (Selig & Little, 2012).

Analysis

There are 921 observations (19.78%) had missing values on at least one variable of interest. Little's MCAR test showed that data were not missing completely at random ($\chi^2(3684) = 5689.96$, $p < 0.001$). To maximise the statistical power while minimising bias, Multivariate Imputation by Chained Equations (MICE) was conducted to compensate the missing values with the 'mice' package in R. Test of multicollinearity for all variables resulted in the variance inflation factor (VIF) scores ranging from 1.05 to 1.45, indicating

no concerns about multicollinearity. To test the relationship between support balance and well-being indicators, multiple regression analyses controlled for covariates were conducted. In the first three regression models, imbalanced giving and imbalanced receiving were combined to produce a dummy variable with two categories including balanced support and imbalanced support, while variables of quality of life, depression and life satisfaction in T3 were set as dependent variables in each model. In the follow-up analyses, support balance was categorized as three factors of imbalanced giving, balanced support, and imbalanced receiving. In all regression models, dependent variables in T1 and T2 were included, providing a longitudinal view of the relations as well as stronger evidence of the relationships. To test the robustness of results, additional regressions without dependent variables in T1 and T2 were conducted as sensitivity analyses. All data analyses were conducted using R version 4.2.2. $p < 0.05$ was considered statistically significant.

RESULTS

Descriptive results

Sample characteristics are presented in **Table 1** (Data characteristics in each sample exclusion step are presented in Supplementary Table 1 in Online Supplementary Material). A total of 4,650 participants with a mean age of 70.64 ranging from 60 to 97 were included in the study. As shown in Table 1, more than half of participants were female and approximately 60% of participants were from western Europe. Support between receiving and giving was imbalanced for over 95% of participants. Importantly, more than half of participants (54.86%) reported to have given more support than received, which is consistent with the support patterns found in other studies (E. Chen et al., 2021; T. Li et al., 2011).

Relationship between balanced vs. imbalanced support and subjective well-being

Table 2 shows the relationship between (im) balanced support and subjective well-being. Comparing the different effects of balanced and imbalanced support, there were no significant differences for all subjective well-being indicators. Although age was negatively related to quality of life ($\beta = -0.060$, $p < 0.001$) and positively related to depression ($\beta = 0.012$, $p < 0.001$), the effect of increasing age on subjective well-being is minimal. Compared to those from Western Europe, participants from Eastern Europe had a lower level of quality of life ($\beta = -0.592$, $p < 0.01$) and life satisfaction ($\beta = -0.248$, $p < 0.001$), participant from Northern Europe had a higher level of life satisfaction ($\beta = 0.217$, $p < 0.01$). Those from southern Europe had a higher level of depression ($\beta = 0.229$, $p <$

0.001). Middle ($\beta = 0.383$, $p < 0.05$) and higher ($\beta = 0.506$, $p < 0.01$) levels of education was related to higher level of quality of life but not related to depression and life satisfaction, compared to lower level of education. Financial stress was negatively related to lower quality of life ($\beta = -0.289$, $p < 0.001$), life satisfaction ($\beta = -0.142$, $p < 0.001$), and more symptoms of depression ($\beta = 0.070$, $p < 0.05$). Similarly, participants with higher level of self-rated health reported a higher level of quality of life ($\beta = 0.586$, $p < 0.001$), life satisfaction ($\beta = 0.166$, p < 0.01), and less symptoms of depression ($\beta = -0.190$, $p < 0.001$)

Table 1. Sample Characteristics ($N = 4,650$)

Variable	**Mean**	**SD**	***N (%)***
Age	70.64	7.46	
Gender (female)			3,030 (65.16)
Regions			
South			341 (7.33)
North			641 (13.78)
East			836 (17.98)
West			2,832 (60.90)
Employe status (working)			460 (9.89)
Martial status (partnered)			1,856 (39.91)
Education			
Lower			1,713 (36.84)
Middle			1,830 (39.35)
Higher			1,107 (23.81)
Financial difficulty	2.13	0.96	
Equivalised Income	9.67	0.96	
ADL	0.26	0.80	
IADL	0.39	0.97	
Self-rated health	2.76	1.09	
Quality of life T1 (12-48)	37.12	6.43	
Quality of life T2	37.28	6.40	
Quality of life T3	37.06	6.53	
Depression T1 (0-12)	2.73	2.27	
Depression T2	2.65	2.28	
Depression T3	2.67	2.23	
Life satisfaction T1 (0-10)	7.52	1.88	
Life satisfaction T2	7.38	1.96	
Life satisfaction T3	7.59	1.88	

Table 1. Continued

Variable	Mean	SD	*N (%)*
Cross-time Support Balance			
Balanced support			213 (4.58)
Imbalanced support			
Imbalanced giving			2,551 (54.86)
Imbalanced receiving			1,886 (40.56)

ADL = activities of daily living; IADL = instrumental activities of daily living; T1 = Time 1; T2 = Time 2; T3 = Time 3.

In the follow-up steps, we separated the imbalanced support into imbalanced giving and imbalanced receiving groups. We performed two regressions models for each dependent variable: first model included reference group BS, and the second model included IG as reference group. Table 3 combines these two regression models (see Supplementary Tables 2 and 3 for detailed results on the separate regression models). There were no significant differences regarding the effect of imbalanced giving compared to balanced support on all well-being measures. Imbalanced receiving compared to balances support was related to a lower level of quality of life (β = -0.832, $p < 0.01$), a higher level of depression (β = 0.286, $p < 0.05$), but not a significant different level of life satisfaction. Comparison between imbalanced giving and imbalanced receiving showed that imbalanced receiving was related to a lower quality of life (β = -0.883, $p < 0.001$), lower life satisfaction (β = -0.188, $p < 0.001$), and more symptoms of depression (β = 0.261, $p < 0.001$). The relationships between demographic factors and well-being were in line with the previous regression. Similarly, participants with less financial stress and better self-rated health experienced better subjective well-being, as indicated by all measures. Additional sensitivity analysis where dependent variables in T1 and T2 were removed from regressions, showed parallel patterns although effect sizes decreased (see Supplementary Tables 4 and 5). In general, results above showed that giving more support than receiving is not differently related to subjective well-being, while over-receiving support from others is related to worse subjective well-being.

Table 2. Regression results for relationships of (im) balanced support and subjective well-being

Variable	Quality of Life T3		Depression T3		Life Satisfaction T3	
	Estimate	**SE**	**Estimate**	**SE**	**Estimate**	**SE**
Imbalanced vs. Balanced	-0.283	0.306	0.123	0.121	-0.039	0.106
Age	-0.060***	0.010	0.012***	0.004	0.001	0.003
Gender	0.222	0.141	-0.221***	0.056	-0.064	0.049
North	-0.135	0.195	-0.151*	0.077	0.217**	0.067
South	-0.119	0.261	0.229***	0.102	-0.072	0.089
East	-0.592**	0.198	0.036	0.078	-0.248***	0.069
Employment	-0.015	0.231	-0.138	0.091	-0.001	0.080
Marital Status	0.251	0.138	0.052	0.055	0.067	0.048
Education (Low)						
Middle	0.383*	0.155	-0.105	0.061	0.012	0.053
High	0.506**	0.183	-0.059	0.072	-0.027	0.063
Financial stress	-0.289***	0.079	0.070*	0.030	-0.142***	0.027
Equivalised income	0.160*	0.082	0.033	0.032	-0.001	0.028
ADL	-0.007	0.104	-0.019	0.041	-0.049	0.036
IADL	-0.217*	0.075	0.130	0.035	-0.084	0.031
Self-rated health	0.586***	0.075	-0.190***	0.029	0.166**	0.025
Quality of life T1	0.243***	0.015				
Quality of life T2	0.435***	0.014				
Depression T1			0.231***	0.014		
Depression T2			0.351***	0.014		
Life Satisfaction T1					0.214***	0.015
Life Satisfaction T3					0.293***	0.014
Intercept	13.483***	1.003	0.486	0.334	3.709***	0.407
Adjusted R^2	0.562		0.413		0.358	

ADL = activities of daily living; IADL = instrumental activities of daily living; T1 = Time 1; T2 = Time 2; T3 = Time 3. Reference groups: gender = female; regions = west; employment = unemployed; marital status = not partnered; education level = low; ***p < .001; **p < .01; *p < .05.

Table 3. Regression results for relationships between support balance types and subjective well-being

Variable	Quality of Life T3		Depression T3		Life Satisfaction T3	
	Estimate	SE	Estimate	SE	Estimate	SE
Imbalanced giving vs. Balanced support	0.051	0.310	0.025	0.122	0.109	0.107
Imbalanced receiving vs. Balanced support	-0.832**	0.318	0.286*	0.126	-0.079	0.110
Imbalanced receiving vs. Imbalanced giving	-0.883***	0.146	0.261***	0.058	-0.188***	0.050
Age	-0.047***	0.010	0.008*	0.004	-0.003	0.003
Gender	0.175	0.140	-0.210***	0.056	-0.074	0.049
Regions (West)						
North	-0.163	0.194	-0.142	0.077	0.211**	0.067
South	-0.132	0.260	0.228*	0.102	-0.070	0.089
East	-0.618**	0.197	0.044	0.078	-0.256***	0.069
Employment	0.025	0.231	-0.141	0.091	-0.001	0.080
Marital Status	0.216	0.138	0.064	0.055	0.060	0.048
Education (Low)						
Middle	0.373*	0.155	-0.102	0.061	-0.009	0.053
High	0.519**	0.183	-0.063**	0.072	-0.025	0.063
Financial stress	-0.307**	0.079	0.074*	0.030	-0.144***	0.027
Equivalised income	0.193*	0.081	0.025	0.032	0.005	0.028
ADL	0.021	0.104	-0.027	0.041	0.042	0.036
IADL	-0.154	0.090	0.111**	0.036	-0.070*	0.031
Self-rated health	0.537***	0.075	0.173***	0.029	0.154***	0.025
Quality of life T1	0.242***	0.015				
Quality of life T2	0.428***	0.014				
Depression T1			0.230***	0.014		
Depression T2			0.347***	0.014		
Life Satisfaction T1					0.213***	0.015
Life Satisfaction T2					0.291***	0.014
Adjusted R2	0.566		0.415		0.360	

Notes. ADL = activities of daily living; IADL = instrumental activities of daily living; T1 = Time 1; T2 = Time 2; T3 = Time 3. Reference groups: gender = female; regions = west; employment = unemployed; marital status = not partnered; education level = low; ***p < .001; **p < .01; *p < .05.

Figure 2 displays the means of subjective well-being indicators by types of support balance. Although the difference between balanced support and imbalanced giving was not significant, there was a trend that imbalanced giving was related to better subjective well-being in all indicators.

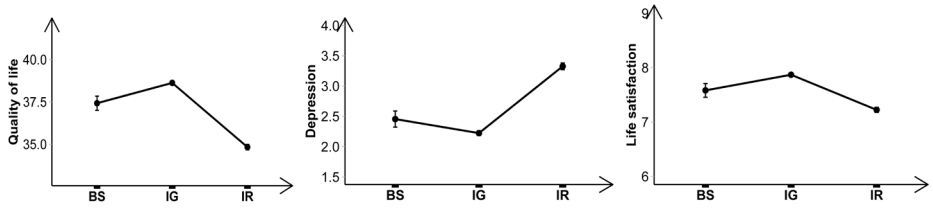

Figure 2. Means of subjective well-being indicators by types of support balance. IR = Imbalanced receiving. IG = Imbalanced giving. BS = Balanced support.

DISCUSSION

Overburden of family caregivers makes instrumental support from non-relatives more important for older people. This study focused specifically on the relationships between older people and non-relatives. Using a cross-time measurement of support balance, our findings indicate that balanced support or imbalanced giving with non-relatives is related to a higher level of subjective well-being for older people than imbalanced receiving.

Previous related studies claimed that balanced support is more beneficial for older people compared to either imbalanced giving or imbalanced receiving, while our results showed that balanced support is not associated with better subjective well-being than imbalanced support, which seems to falsify our first hypothesis. Follow-up analyses showed that although imbalanced receiving is associated with a lower level of well-being than balanced support, imbalanced giving is not. Specifically, balanced support and imbalanced giving were both associated with higher level of well-being than imbalanced receiving.

Our results are not in line with the social exchange theory and partly with equity theory (Supplementary Table 6), which is different from the previous studies (E. Chen et al., 2021; D. Wang & Gruenewald, 2019). However, Wang (2019) measured the perception of balance rather than the intensity of support behavior as we did and failed to distinguish between instrumental and emotional support. Given the different role of emotional support and instrumental support, the measurement that combines support types may counterbalance each other. In contrast with our study, Chen (2021) did not focus on relationships with non-relatives nor on older people particularly. While the lifespan

perspective of social support suggests that the effect of social support on people's psychological well-being varies according to their age (Ingersoll-Dayton & Antonucci, 1988; T. Li et al., 2011). Declining physical condition and withdrawing from the labour market results in a decreased capacity to pay back what was received, which triggers feelings of indebtedness and make older people more sensitive to the negative feeling of over-receiving than younger people. At the same time, giving support especially to non-relatives, offers an opportunity for older people to feel that they still provide community value and a sense of contribution, and thus may have protective effects on the negative effect of receiving support (Thomas, 2010a).

Additionally, another possible reason why we found different results from previous studies might relate to the cross-time design of balance calculation in our study. While previous studies measured balance at one single time point, we measured multiple points in time. The concept of "support bank" suggests that individuals keep track of the support they exchange with others. The cross-time measurement might therefore be more accurate in capturing the concept of balance.

We found a significantly better effect on subjective well-being from imbalanced giving than from imbalanced receiving, which confirmed our second hypothesis. It is worth noting that there was a trend suggesting that giving more than receiving is most beneficial to well-being, although the difference with balanced support did not reach statistical significance. This result appears to support the esteem-enhancement theory. Providing help to others might be beneficial even if there is no balanced reward because the behavior of caring for others itself is constructive and restorative. While another study demonstrated the esteem-enhancement theory in intimate relationships (Väänänen et al., 2005), our study suggests that it may also apply to relationships with non-relatives for older people.

In addition, the esteem-enhancement theory might explain the negative effect of imbalanced receiving. Over-seeking help from others means one must admit to lacking the competence to cope independently and thus bring negative effects to one's self-esteem. Consequently, receiving imbalanced support may lead to distress, while giving more support enhances well-being (J. Liang et al., 2001). Our findings are consistent with previous finding that older people who over-received support reported more anger than those who under-received, because the inability to reciprocate undermines their sense of independency and self-esteem (Bracke et al., 2008).

Cautions need to be paid when explaining our findings. First, we measured self-reported support intensity to calculate support balance. However, participants may overestimate

the support they have provided, as individuals tend to underreport the support they have received (I. F. Lin & Wu, 2018). The sense of balance may not always align with an equal amount of support exchange behavior. One may perceive a relationship as balanced even when the exchange of support behavior is imbalanced (Fyrand, 2010). Therefore, the beneficial effect of imbalanced support giving might be overestimated. Second, although we performed auto-regressive models, which is considered to give stronger evidence for causal relationship compared to simple regressions due to its cross-time design, this does not imply that the relationship between support balance and subjective well-being is unidirectional. Previous studies have demonstrated a reciprocal relationship between social support and health outcomes for older people (Santini et al., 2015; Schwartz & Litwin, 2019). Future research should be conducted to test the bi-directional relationship between support balance and subjective well-being with analysis methods such as cross-lagged analysis. Additionally, country variance should be noticed when explaining our results. Different social support characteristics across European countries have been repeatedly found in previous research (Courbage et al., 2020; Maia et al., 2022). How support balance with non-relatives affects older people across different cultural contexts could be explored in future research.

Several limitations should be noted in this study. First, strict exclusion criteria for sample selection have led to a large number of samples being deleted. Participants in the final samples were slightly younger, healthier, more likely to be single, had higher education and income, and were more likely to be female. This reduced the population representativeness of study population. However, considering that older people who live alone are usually more vulnerable and in need of support, and that research shows a stronger protective effect of social connection for widowed solo individuals (Schafer et al., 2022), our study still offers important contributions. Second, given that participants answered questions of support receiving on behalf of their partner in wave 4 and 5 and answered on behalf of themselves in wave 6, this question variation may have led to a less accurate calculation of support balance. Third, we were not able to distinguish the effects of each sub-type of support given the available data in SHARE. Previous studies suggest that different support types may have different impact on well-being (Thomas, 2010a; Tomini et al., 2016). Future longitudinal studies could be conducted focusing on different support types. Last, the intensity of support was measured as the frequency of receiving and giving, which might not be very precise to conceptualize the balance between giving and receiving. Future research with more precise measurements such as the hours of support could be employed to test the effect of support balance more precisely.

In conclusion, with a population-based sample of older persons, our study highlights the advantages of providing support and the negative effects of receiving excessive support in non-family relationships. These findings highlight the relevance of the esteem-enhancement theory over the social exchange theory or the equity theory when it comes to support given and received by older people. Given the vital role of social support for older individuals, the results suggest that policies and practices should prioritize creating an age-friendly environment that promotes active participation and mutual support among older people, as this may be effective to enhance their well-being.

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SUPPLEMENTAL MATERIALS

Calculation of independent variable

The key independent variable in this study is the long-term support balance between support that has been provided and received among older people, which is conceptually in line with previous studies (E. Chen et al., 2021; Irby-Shasanmi & Erving, 2020; T. Li et al., 2011). To get the long-term support balance indicator, we first calculated the support intensity of giving and receiving separately.

Support receiving In the SHARE dataset, individuals were asked whether they have received support from people outside their household with a question of "thinking about the last 12 months, has any family member from outside the household, or any friend or neighbor given you any kind of help…?" Help from outside the household could be help with personal care, practical household help, or help with paperwork. A showcard containing activities of personal care (e.g. dressing, bathing or showering, eating, getting in or out of bed, using the toilet), practical household help (with home repairs, gardening, transportation, shopping, household chores) and paperwork (e.g. filling out forms, settling financial or legal matters) was used as assistance by showing to respondents during question asking. In wave 4 and 5, help to either respondents or their husband/wife/partner was both included by asking the question "Please look at card 27. Thinking about the last twelve months, has any family member from outside the household, any friend or neighbor given you (or your husband/wife/partner) personal care or practical household help?" It should be noticed that activities of paperwork were not asked explicitly in the question but were included in the activities on the showcard. Therefore, activities of paperwork were also included in this study. In wave 6, respondents were asked about support given to themselves with question "Please look at card 27. Thinking about the last twelve months, has any family member from outside the household, any friend or neighbor given you any kind of help listed on this card?". Activities on showcard are the same as in wave 4 and 5. If respondents answered "yes", they were guided to identify 3 persons on a relationship list from whom they have received help most often, in which both family members and non-family members were included. After identifying three help providers, participants were further asked how often they receive help from these three persons separately, with answers ranging from 1) almost every day, 2) almost every week, 3) almost every month, and 4) less often. We reverse-coded the frequency to a sequence with higher value indicating higher frequency. An additional value of 0 was coded if respondents had never received any support from people outside household or only identified family members as support providers. This process produced a variable of received support intensity per wave ranging: 0) never;

1) less often; 2) almost every month; 3) almost every week; 4) almost every day. Sum frequency of all three people was calculated with answers ranged from 0-12 for each participant per wave. Finally, the average frequency across three waves was calculated as the long-term intensity of receiving support from non-relatives.

Support giving Support giving were measured by support that respondents have personally given to others. Individuals were first asked with a question of "in the last 12 months, have you personally given any kind of help . . . to a family member from outside the household, a friend, or a neighbor?" Questions about support giving used the same showcard as questions about support receiving. Respondents who answered 'yes' needed to identify three persons on a relationship list and give the frequency they gave help for each of them. Similar to support receiving, values were reverse-coded and 0 was additionally coded for those who had not given support to targeted group of people in the present wave, which produced a variable per wave ranging: 0) never; 1) less often; 2) almost every month; 3) almost every week; 4) almost every day. Sum frequency of all three people was calculated with answers ranged from 0-12 for each participant per wave. We further calculated the averaged frequency across three waves as the longitudinal intensity of giving support to non-relatives.

Support balance Support balance was calculated as the difference between the averaged intensity of giving and receiving, that is, the waves-averaged frequency of support given minus that of support received. We created two separate categorical variables to capture (im) balance. In the first categorical variable, balanced support was coded as 0 and both negative and positive imbalance was coded as 1. In the second categorical variable, negative scores were categorized as imbalanced receiving, means more receiving than giving; 0 was categorized as balanced support, and positive scores were categorized as imbalanced giving, that is, giving more support than receiving. Variables with different categorization strategies were put into different models for analysis.

Supplementary Table 1. Data characteristics for each sample selection step

Variable	Data_T1 (N = 39,100)			Data_T123 (N = 19,837)			Data_Final (N = 4,650)		
	Mean	SD	N (%)	Mean	SD	N (%)	Mean	SD	N (%)
Age	70.86	7.95		70.06	7.25		70.64	7.46	
Gender			21,737 (55.59)			11,321 (57.07)			3,030 (65.16)
Regions									
South			6,524 (11.25)			3,349 (16.89)			341 (7.33)
North			3,082 (5.31)			2,089 (10.53)			641 (13.78)
East			9,686 (16.70)			4,061 (20.47)			836 (17.98)
West			19,808 (34.15)			10,338 (52.11)			2,832 (60.90)
Employment			3,307 (8,46)			2,091 (10.54)			460 (9.89)
Marital status			26,375 (67.46)			13,388 (67.49)			1,856 (39.91)
Education									
Lower			18,114 (46.32)			8,577 (43.24)			1,713 (36.84)
Medium			13,320 (34.07)			7,066 (35.62)			1,830 (39.35)
Higher			6,782 (17.35)			3,848 (19.40)			1,107 (23.81)
Financial distress	2.24	0.97		2.16	0.95		2.13	0.96	
Income	9.53	0.95		9.62	0.94		9.67	0.96	
ADL	0.34	1.01		0.21	0.74		0.26	0.80	
IADL	0.53	1.31		0.33	0.94		0.39	0.97	
Self-rated health	2.62	1.06		2.76	1.04		2.76	1.09	
QoL T1	36.73	6.57		37.42	6.26		37.10	6.42	
QoL T2				37.52	6.30		37.27	6.43	
QoL T3				37.21	6.31		37.03	6.56	

Supplementary Table 1. Continued

Variable	Data_T1 (N = 39,100)			Data_T123 (N = 19,837)			Data_Final (N = 4,650)		
	Mean	SD	N (%)	Mean	SD	N (%)	Mean	SD	N (%)
Depression T1	2.65	2.32		2.44	2.18		2.72	2.26	
Depression T2				2.45	2.21		2.64	2.28	
Depression T3				2.50	2.22		2.68	2.23	
Life satisfaction T1	7.58	1.87		7.74	1.78		7.52	1.88	
Life satisfaction T2				7.50	1.89		7.38	1.96	
Life satisfaction T3				7.72	1.78		7.59	1.87	

Notes. ADL = activities of daily living; IADL = instrumental activities of daily living; QoL = quality of life; T1 = Time 1; T2 = Time 2; T3 = Time 3. Data_T1: Data including participants who participated in wave 4; Data_T123: Data including participants who participated in wave 4, wave 5 and wave6; Data_final: Final data for analysis.

Supplementary Table 2. Regression results for relationships between support balance types and subjective well-being (reference = Balanced support)

Variable	Quality of Life T3		Depression T3		Life Satisfaction T3	
	Estimate	SE	Estimate	SE	Estimate	SE
Imbalanced giving vs. Balanced support	0.051	0.310	0.025	0.122	0.109	0.107
Imbalanced receiving vs. Balanced support	-0.832**	0.318	0.286*	0.126	-0.079	0.110
Age	-0.047***	0.010	0.008*	0.004	-0.003	0.003
Gender	0.175	0.140	-0.210***	0.056	-0.074	0.049
Regions (West)						
North	-0.163	0.194	-0.142	0.077	0.211**	0.067
South	-0.132	0.260	0.228*	0.102	-0.070	0.089
East	-0.618**	0.197	0.044	0.078	-0.256***	0.069
Employment	0.025	0.231	-0.141	0.091	-0.001	0.080
Marital Status	0.216	0.138	0.064	0.055	0.060	0.048
Education (Low)						
Middle	0.373*	0.155	-0.102	0.061	-0.009	0.053
High	0.519**	0.183	-0.063**	0.072	-0.025	0.063
Financial stress	-0.307**	0.079	0.074*	0.030	-0.144***	0.027
Equivalised income	0.193*	0.081	0.025	0.032	0.005	0.028
ADL	0.021	0.104	-0.027	0.041	0.042	0.036
IADL	-0.154	0.090	0.111**	0.036	-0.070*	0.031
Self-rated health	0.537***	0.075	0.173***	0.029	0.154***	0.025
Quality of life T1	0.242***	0.015				
Quality of life T2	0.428***	0.014				
Depression T1			0.230***	0.014		
Depression T2			0.347***	0.014		
Life Satisfaction T1					0.213***	0.015
Life Satisfaction T2					0.291***	0.014
Intercept	12.848***	1.249	0.572***	0.462	3.529***	0.409
Adjusted R^2	0.566		0.415		0.360	

Notes. ADL = activities of daily living; IADL = instrumental activities of daily living; T1 = Time 1; T2 = Time 2; T3 = Time 3. Reference groups: gender = female; regions = west; employment = unemployed; marital status = not partnered; education level = low; ***p < .001; **p < .01; *p < .05.

Supplementary Table 3. Regression results for relationships between support balance types and subjective well-being

Variable	Quality of Life T3		Depression T3		Life Satisfaction T3	
	Estimate	**SE**	**Estimate**	**SE**	**Estimate**	**SE**
Imbalanced receiving vs. Balanced support	-0.832**	0.318	0.286*	0.126	-0.079	0.110
Imbalanced receiving vs. Imbalanced giving	-0.883***	0.146	0.261***	0.058	-0.188***	0.050
Age	-0.047***	0.010	0.008*	0.004	-0.003	0.003
Gender	0.175	0.140	-0.210***	0.056	-0.074	0.049
Regions (West)						
North	-0.163	0.194	-0.142	0.077	0.211**	0.067
South	-0.132	0.260	0.228*	0.102	-0.070	0.089
East	-0.618**	0.197	0.044	0.078	-0.256***	0.069
Employment	0.025	0.231	-0.141	0.091	-0.001	0.080
Marital Status	0.216	0.138	0.064	0.055	0.060	0.048
Education (Low)						
Middle	0.373*	0.155	-0.102	0.061	-0.009	0.053
High	0.519**	0.183	-0.063**	0.072	-0.025	0.063
Financial stress	-0.307**	0.079	0.074*	0.030	-0.144***	0.027
Equivalised income	0.193*	0.081	0.025	0.032	0.005	0.028
ADL	0.021	0.104	-0.027	0.041	0.042	0.036
IADL	-0.154	0.090	0.111**	0.036	-0.070*	0.031
Self-rated health	0.537***	0.075	0.173***	0.029	0.154***	0.025
Quality of life T1	0.242***	0.015				
Quality of life T2	0.428***	0.014				
Depression T1			0.230***	0.014		
Depression T2			0.347***	0.014		
Life Satisfaction T1					0.213***	0.015
Life Satisfaction T2					0.291***	0.014
Intercept	12.899***	1.223	0.597***	0.448	3.637***	0.398
Adjusted R^2	0.566		0.415		0.360	

Notes. ADL = activities of daily living; IADL = instrumental activities of daily living; T1 = Time 1; T2 = Time 2; T3 = Time 3. Reference groups: gender = female; regions = west; employment = unemployed; marital status = not partnered; education level = low; ***p < .001; **p < .01; *p < .05.

Supplementary Table 4. Sensitivity analysis: regression results for relationships of (im) balanced support and subjective well-being in sensitivity analysis

Variable	Quality of Life T3		Depression T3		Life Satisfaction T3	
	Estimate	**SE**	**Estimate**	**SE**	**Estimate**	**SE**
Imbalanced vs. Balanced	0.067	0.374	0.082	0.139	0.060	0.117
Age	-0.090***	0.012	0.018***	0.004	0.006	0.004
Gender	0.330	0.172	-0.593***	0.064	-0.090	0.054
Regions (West)						
North	0.133	0.239	-0.242**	0.088	0.389***	0.074
South	-2.017***	0.315	0.562***	0.117	-0.085	0.098
East	-0.437	0.241	0.077	0.089	-0.515***	0.075
Employment	-0.040	0.283	-0.073	0.105	-0.007	0.088
Marital Status	0.425*	0.169	0.084	0.063	0.190***	0.053
Education (Low)						
Middle	0.752***	0.190	-0.241***	0.070	0.038	0.059
High	0.715**	0.224	-0.193*	0.083	-0.029	0.070
Financial stress	-1.355***	0.093	0.258***	0.034	-0.353***	0.029
Equivalised income	0.465***	0.099	0.054	0.037	0.044	0.031
ADL	-0.226	0.127	0.068	0.047	-0.075	0.040
IADL	-0.641***	0.109	0.248***	0.040	-0.125***	0.034
Self-rated health	1.883***	0.085	-0.549***	0.032	0.411***	0.027
Intercept	36.275***	1.414	1.974***	0.524	6.362***	0.441
Adjusted R2	0.344		0.223		0.213	

ADL = activities of daily living; IADL = instrumental activities of daily living; T1 = Time 1; T2 = Time 2; T3 = Time 3. Reference groups: gender = female; regions = west; employment = unemployed; marital status = not partnered; education level = low; ***p < .001; **p < .01; *p < .05.

Supplementary Table 5. Sensitivity analysis: regression results for relationships between support balance types and subjective well-being

Variable	Quality of Life T3		Depression T3		Life Satisfaction T3	
	Estimate	SE	Estimate	SE	Estimate	SE
Imbalanced giving vs. Balanced support	0.668	0.377	-0.084	0.140	0.166	0.118
Imbalanced receiving vs. Balanced support	-0.942*	0.387	0.361*	0.144	-0.119	0.122
Imbalanced receiving vs. Imbalanced giving	-1.609***	0.177	0.445	0.066	-0.286	0.056
Age	-0.067***	0.012	0.011**	0.004	0.010**	0.004
Gender	0.242	0.171	-0.569***	0.064	-0.106*	0.054
Regions (West)						
North	0.073	0.237	-0.226*	0.088	0.379***	0.074
South	-1.995***	0.313	0.556***	0.116	-0.081	0.098
East	-0.484*	0.239	0.090	0.089	-0.523***	0.075
Employment	-0.022	0.281	-0.078	0.104	-0.004	0.088
Marital Status	0.357*	0.168	0.103	0.062	0.178***	0.053
Education (Low)						
Middle	0.725***	0.188	-0.233***	0.070	0.033	0.059
High	0.732***	0.222	-0.198*	0.083	-0.026	0.070
Financial stress	-1.365***	0.092	0.261***	0.034	-0.355***	0.029
Equivalised income	0.518***	0.099	0.039	0.037	0.054	0.031
ADL	-0.170	0.126	0.053	0.047	-0.065	0.040
IADL	-0.517***	0.109	0.214***	0.041	-0.103**	0.034
Self-rated health	1.764***	0.086	-0.516***	0.032	0.389***	0.027
Adjusted R^2	0.356		0.230		0.218	

ADL = activities of daily living; IADL = instrumental activities of daily living; T1 = Time 1; T2 = Time 2; T3 = Time 3. Reference groups: gender = female; regions = west; employment = unemployed; marital status = not partnered; education level = low; ***p < .001; **p < .01; *p < .05.

Supplementary Table 6. Summary of the relationship between related theories and results

Theories	Connection with research	Whether theory supported
Equity theory	Balanced support> Imbalanced support	Partial support
Social exchange theory	Imbalanced receiving > (Imbalanced giving/ Balanced support)	No
Esteem-enhancement theory	Imbalanced giving > (Imbalanced receiving/ Balanced support)	Yes

CHAPTER 4

Facilitating Informal Support Among Older People Through Community-Based Initiatives: Identifying Underlying Mechanisms

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ABSTRACT

Background and Objectives: In the context of accelerated global aging and increasing insufficiencies in long-term care delivery, older people are encouraged to provide informal support to each other within their communities. However, the mechanisms facilitating such informal support among older people remain unclear. This study aims to address this gap by investigating the perspectives and experiences of various stakeholders involved in initiatives aimed at stimulating informal support in the community.

Research Design and Methods: A qualitative multiple-case study was conducted in five Dutch initiatives stimulating informal support. Semi-structured interviews were conducted with a total of 23 different stakeholders and relevant documents were analyzed. An abductive thematic analysis approach was used for data analysis.

Results: Our analysis shows that community-based initiatives stimulate mutual support among older people by providing a coherent set of activities and facilities that indirectly, through community building, and directly influence individual behavior. On the community level, initiatives strengthen social cohesion, in terms of for example shared values and feelings of belonging. On the individual level initiatives create opportunities to provide support, help individuals to recognise and strengthen their abilities to give support and stimulate individual motivation.

Discussion and Implications: Our findings underscore the need for policies that support informal care through complementary processes, which work in tandem with formal care systems. Policies and practices taking the identified mechanisms into account are likely to stimulate older people to provide informal support to each other in the community, thus enhancing aging in place.

INTRODUCTION

Accelerated global aging and cutbacks in healthcare budgets have increased pressure on healthcare delivery systems worldwide(Dieleman et al., 2016). Many countries advocate increasing reliance on informal support as a strategy to cope with insufficiencies in long-term services and support (Pani-Harreman et al., 2021). Informal support among older people is also seen as a way of stimulating active aging. Informal support refers to the assistance provided by those outside formal organizations and within one's personal network and relationships (Lipman & Longino, 1982). Informal support encompasses highly heterogeneous activities in the community setting from personal care to daily help such as transport (Rutherford & Bu, 2018; Van Den Berg et al., 2004). In this study, we employ a broad definition of informal support that covers all informal helping behaviors including informal care and volunteering (Siira et al., 2020, 2022), but we exclude informal help within one's own family.

In recent decades, many European countries have advocated the perspective of active aging, which posits that community-dwelling older people should be viewed as valuable social capital and have the right to keep participating and contributing to the community (Foster & Walker, 2015). Facilitating and encouraging older people to support each other provides them with better opportunities to stay active and involved, live independently and postpone institutionalized care (Rudnicka et al., 2020). Furthermore, active involvement of older people may also help to deal with shortcomings in long-term care services and support. Examples of initiatives and projects aimed at stimulating mutual support are the "time bank" initiatives in the UK (Simon & Boyle, 2008), the "Village" (Scharlach et al., 2012) and "NORC" (Naturally Occurring Retirement Community) programs in the US (Greenfield, 2016). Although some programs were not developed specifically for older people, older people have become the vast majority of participants, which has led to interest from gerontology-related research (Greenfield, 2016). Despite the variations in type, size and form, one of the common features among these initiatives is that they all encourage people to make use of their own resources and support each other while aiming to enable older people to stay in the community as long as possible in order to achieve better "aging in place". In the Netherlands, the Social Support Act (WMO) was first introduced in 2007 and expanded in 2015 to distribute care and support responsibilities to municipalities and communities (Berkers et al., 2021). One of the core principles of the WMO is that residents need to increase their reliance on informal support from their personal social network. Within this context, a national platform called "Nederland Zorgt voor Elkaar (the Dutch care for each other)" was launched to unite 1,500 Dutch citizens' initiatives focusing on the field of welfare, care, and living, aiming to stimulate mutual help among community-dwelling older people in the Netherlands.

The social-ecological model is one of the most widely used frameworks in exploring the role of the community context in informal support behavior among older people (Greenfield, 2012, 2016). According to the social-ecological theory, individuals are embedded in the context where multiple levels of environmental characteristics are nested. Therefore, individuals' behavior is not only determined by their personal characteristics but also depends on the dynamic interplay between individual factors and environmental factors (Greenfield, 2012). The concept of "community gerontology" further develops this perspective by introducing the meso-level, which is represented by the community/organization, as a critical bridge between macro-level policies and micro-level individual factors in gerontology in the community (Greenfield et al., 2019). By focusing on the meso-level, community gerontology provides a lens to examine how community organizations interact with individuals and the community to foster a supportive environment for aging in place.

Numerous studies have investigated the beneficial effect of providing informal support for older people such as improving well-being and reducing depression (Murayama et al., 2021; Xia et al., 2024a). Nevertheless, less is known about the factors at multiple levels that facilitate older people's participation in informal support, especially regarding the underlying mechanisms that encourage older people to provide informal support to community members (Hou & Cao, 2021). On the individual level, studies have mainly focused on the motivation for informal support provision (Hansen & Slagsvold, 2020; Kramer et al., 2021; Same et al., 2020; Zarzycki & Morrison, 2021). These studies show that, on the one hand, older people are motivated intrinsically, where individuals are motivated by an inherent, internalised drive to provide support. On the other hand, people can be extrinsically motivated by external pressures, instrumental rewards or social values (Zarzycki & Morrison, 2021). Few studies focus on individual factors other than motivation. Some studies have found that social demographic factors were relevant for older people's willingness to participate in mutually informal support. For example, females are found to participate more in providing informal support due to different cultural gender expectations compared to males (Zygouri et al., 2021). Perceived support from one's social relationships also matters (Inagaki & Orehek, 2017). Furthermore, community-level factors are important in explaining the mechanisms that facilitate older people's provision of informal support to community members, especially support given outside the family. For example, Greenfield (2016) investigated a community-based program and found that neighborhood support was strengthened by the program. A strong social network seems to be relevant, since individuals can be invited by network members to contribute (P. Lu et al., 2021). In addition, living in a community that is safe and resourceful, and has a strong sense of community among residents was associated with more informal support provision (P. Lu et al., 2021). While studies have investigated

the effects of individual and community factors on informal support among community-dwelling older people, the mechanisms through which higher-level factors influence individual-level factors, leading to informal support, remain underexplored.

Current study

The aim of this study is to explore how and why community-based initiatives affect mutual support behavior among older people. We take a comprehensive view of different levels of factors and the connections between them by exploring the perspectives of different stakeholders in the context of initiatives that aim to facilitate mutual support in the community. We specifically investigate five initiatives in the Netherlands, guided by the following research question:

What are the underlying mechanisms through which community-based initiatives stimulate mutual support among community-dwelling older people?

METHODS

Study design

This study is a qualitative multiple case study aiming to explore the mechanisms that facilitate older people in supporting each other in the community. A multiple case study allows for in-depth, multi-faceted explorations of the experiences and perceptions of participants and is appropriate for research aiming to understand a complex social phenomenon that is enacted in diverse contexts (Stake, 2013).

This study was approved by the Ethics Review Committee of the Erasmus University Rotterdam (application number ETH2223-0417). All participants provided oral or written informed consent.

Selection of cases and participants

We identified relevant initiatives through a national platform in which 1,500 Dutch initiatives are united, called "Nederland Zorgt voor Elkaar (the Dutch care for each other)". We set inclusion criteria for initiatives that: 1) focus on stimulating informal support in the community; and 2) involve older people aged 65 and above in providing informal support to each other. In order to include comprehensive characteristics of these initiatives, we contacted the general coordinator of the platform, who is familiar with all the initiatives, to assist us with the case selection. We identified two important factors

for case-selection, one being the location of the initiative, which could be rural or urban, and the other being whether the initiatives develop in households where residents live in the same building(s) or in neighborhoods. The general coordinator assisted in identifying of cases by providing the researchers with a list of recommended initiatives that met the criteria (see Supplementary Materials). A total of five initiatives were purposefully selected. The overall characteristics of initiatives are illustrated in **Table 1**. It is worth noting that some initiatives could not be categorized under a single factor. For example, Austerlitz Zorgt organizes both neighborhood-based informal support and household-based program in the village. The final selection was checked and discussed with the general coordinator.

Table 1. Overview of initiatives

Initiative	Rural/ Urban	Type of organization	Coordinator	Initiative type
Zorgcoöperatie Hoogeloon	Rural	Care Cooperative	Yes	Neighborhood-based & Household-based
Vitality Cooperative America	Rural	Care Cooperative	Yes	Neighborhood-based & Household-based
Buurtcoöperatie Apeldoorn-South	Urban	Neighborhood Cooperative	Yes	Neighborhood-based
Austerlitz Zorgt	Rural	Care Cooperative	Yes	Neighborhood-based & Household-based
Humanitas Deventer	Urban	Residential Care Center	Yes	Household-based

Different stakeholders, including both formal (e.g. initiative board members or coordinators) and informal (older residents) support providers, were interviewed to understand their experiences with informal support among older people in the initiative. The general coordinator of "Nederland Zorgt voor Elkaar" assisted us by contacting the board member of each initiative, who further helped us engage with interview participants. For each selected initiative, a snowball strategy was used to participants. A total of twenty-three individuals participated in the study, formally in twenty-one interviews. Given that most initiatives in "Nederland Zorgt voor Elkaar" are located at small cities or villages, participants in this study are primarily white and local Dutch residents. The background information of participants is presented in **Table 2**.

Data collection

Semi-structured interviews were conducted for this study. Interview data were collected by two Dutch-speaking researchers either in person or online via Teams between March and May 2023. For in-person interviews, participants were invited to share their views

in a quiet and comfortable space they were familiar with. Questions were asked based on the semi-structured interview guide (**Figure 1**) during the interviews. Additional probing questions were asked based on the response of participants to elicit further details. Each interview took approximately an hour and was recorded digitally.

Table 2. Background information of participants.

Respondent	Age	Gender	Role	Initiative
1	60-65	Male	Coordinator	A
2	70-75	Male	Resident	A
3	75-80	Male	Board member	A
4	80-85	Female	Resident	B
5	65-70	Female	Resident	B
6	70-75	Female	Board member	B
7	70-75	Female	Resident	B
8	60-65	Female	Coordinator	B
9	70-75	Male	Resident	B
10	65-70	Male	Board member	C
11	55-60	Female	Coordinator	C
12	70-75	Female	Resident	C
13	85-90	Female	Resident	C
14	50-55	Female	Coordinator	D
15	70-75	Male	Board member	D
16	70-75	Female	Resident	D
17	65-70	Female	Resident	D
18	65-70	Male	Board member	E
19	65-70	Male	Board member	E
20	50-55	Female	Coordinator	E
21	70-75	Female	Resident	E
22	70-75	Male	Resident	E
23	50-55	Female	Board member	E

Data analysis

We employed an abductive thematic analysis approach to address the research questions, which is a hybrid process of inductive and deductive reasoning (Tavory & Timmermans, 2014; Thompson, 2022). This method allowed us to intertwine empirical data and theoretical frameworks from the literature, thus both parts amplify each other. Transcripts were first familiarized by reading them and identifying meanings and issues

of potential interest in the data. Researchers then identified codes based on the data, through an open inductive process. This approach enabled an open analysis and avoided missing expected results. Next, overarching themes were identified by combining codes. We deductively used sensitizing concepts and theories derived from the literature, such as intrinsic and extrinsic motivations and social-ecological framework and intertwined these concepts with the empirical observations. Meanwhile, researchers inductively moved back and forth between data and literature to rethink existing theories and to unravel aspects not covered by literature, keeping our analysis open for surprising findings. Finally, themes were reviewed and refined by analyzing if the codes for each theme fit together and if they capture the entire data set. Themes and their names were then discussed and refined until consensus was reached. Development of themes and examples quotes are provided in Table 2 of Supplementary Material. Available materials from the initiatives such as their website and work documents provided by the initiatives were also used to help the researchers develop a better understanding of them. Nevertheless, the interview transcripts are the primarily data source, given their richness in capturing personal experiences and perspectives.

Interviews were audio-recorded and transcribed by Dutch interviewers for initial analysis. Transcripts were then translated into English for analysis. Data were imported into ATLAS.ti 23 software for initial coding and analysis (Hwang, 2008). The first author analyzed interviews and then collaboratively checked and completed the analysis with another author (JvW) to enhance the trustworthiness of the study (Hennink et al., 2020). In addition, regular meetings within the research group were held to discuss codes and the delimitation and redefinition of themes as well as theoretical grounds. Furthermore, comparison of results based on Dutch and English transcripts showed good reliability of the results.

Interview guide for older people

- Why did you choose to live here?
- I understand that an important goal of this initiative is that residents support each other:
  - Do you think that happens?
  - Could you describe how resident support each other?
  - How is that going for yourself?
  - Do you experience support from others?
    - Can you give an example of this?
  - Do you support others yourself?
    - Can you give an example of this?
- Why do you choose to help other residents in your neighbourhood?
- Does the initiative contribute to your need in helping other residents?
- How does the initiative contribute to you needs in helping other residents?
- What do you think are the important factors for you to support others?

Interview guide for coordinators/board members

- What is your position in this initiative?
- What does a typical day look like to you?
- What is your expectations for this initiative?
- How is mutual informal support stimulated among older people in this initiative?
  - What kinds of tasks do you see older people performing to support each other?
  - Can you give a concrete example?
- What do you think are the important factors for encouraging mutual informal support?
  - Is there a successful/unsuccessful story?
  - What are the reasons that make it a success story or an unsuccessful story?

Figure 1. Abbreviated interview guide.

RESULTS

Among the five selected initiatives, three initiatives (Zorgcoöperatie Hoogeloon, America Left, and Austerlitz Zorgt) are located in rural areas, and two (Humanitas Deventer, Buurtcoöperatie Apeldoorn-South) are in urban cities. The initiative of Humanitas Deventer was developed in the household, while the rest were mainly developed in the neighborhood. All initiatives organize both informal and formal support for older residents in the community. Importantly, older people are deeply involved in volunteer work in all initiatives. Detailed information about the initiatives is shown in the Supplementary Materials.

Our data analysis indicates that older people are facilitated to participate in informal support when they have the motivation and abilities, and when opportunities are provided. In addition, these individual-level mechanisms are strengthened by factors on the community level, and resources provided on the organizational level. It should be noted that there is much interaction between these levels, making it difficult to strictly discriminate between them.

Individual level mechanisms

Motivation

Many participants mentioned that they were primarily motivated to participate in informal support by the fulfillment they get from helping others (altruism), which means they decided to provide support based on empathy and concern for others:

> *"I just do a lot of volunteer work here. I like it. I've always done it and I like it. And I see that people are happy about it. And then you will be happy yourself. That's just very true." (Resp 21, resident of initiative E)*

Another related motivation participants mentioned repeatedly was being useful and feeling meaningful to society, as they want their lives to have a purpose:

> *"That makes me happier. Honestly. It really makes me happier. To also be able to mean something to someone else." (Resp 20, coordinator of initiative E)*

For some participants, altruism alone may not be sufficient to take action. The combination of altruism and the enjoyment of doing the support task itself creates a win-win situation. One participant noted that her husband's motivation for driving neighbors stemmed not only from his desire to help others but also from the personal enjoyment he gets from driving:

> *"Well, then he says, first of all, I like driving. And driving someone from A to B doesn't take me much time. It is scheduled… doing something good. But in a win-win. That he can do something he likes. Otherwise he won't do it." (Resp 6, board member of initiative B)*

In addition, reciprocity plays a role in motivating older people to participate. This reciprocity covers person-to-person relationships as well as the relationships between individuals and the environment in which they live. The motivation of reciprocity is represented as both delayed reciprocity and preparatory reciprocity. Delayed reciprocity refers to individuals attempting to return what they have received in the past. Some participants believe that they have received support in the past, and they therefore want to give back to others in return:

> *"I was receiving benefits, and I couldn't stand receiving benefits without doing anything in return." (Resp 13, resident of initiative C)*

Some participants referred more to of the concept of preparatory reciprocity, which is based on the belief that what they have provided may have a positive influence on satisfying their future needs:

> *"What I just said, to still think of if we do it, maybe others will do it for us too… I don't actually need it yet, but I think if necessary I can fall back on them. I do have that feeling." (Resp 4, resident of initiative B)*

Ability

To provide informal support not only requires motivation but also the perception of having relevant abilities to support others. Different respondents mention how they realized that their skills and abilities might be relevant (and fun) to support others:

> *"I come from an education background and I've given and developed many courses during my work. And I simply enjoy it. So helping people, it's in an area that I'm proficient in." (Resp 9, resident of initiative B)*

It is worth noting that a skill does not only have to relate to a past profession. Daily skills such as cooking or reading newspapers are sufficient to help:

> *"Well, I like reading the newspaper, because if I can read the newspaper to a lady who can no longer read, I can do that, so to speak." (Resp 10, board member of initiative C)*

Opportunity

Personal motivation and ability may not be sufficient on their own to initiate helping others. Actions can be greatly facilitated when people experience opportunities to engage in informal support, including having available time, social connections and experiencing an open and inviting atmosphere to give support.

Most respondents mentioned that after retirement, they had time to participate in support activities:

> *"Well, they are on the one hand, they are on average mostly elderly people, so also people who have that time, who also in part maybe make this kind of investment." (Resp 7, resident of initiative B)*

Respondents also stated that they are more able to initiate support when they are socially connected. When they know others and meet others regularly it is easier to recognize

the need for support, and also to offer it. In other words, being socially connected helps to align needs and support resources:

> *"You're more in touch with each other and then you also see more of what's going on and then you also care sooner. Yes. If someone needs help you can also jump in together." (Resp 4, resident of initiative B)*

However, respondents emphasized that these social connections and the provision of support should not be forced. People should feel invited and free to participate.

> *"You can't force people to make contacts with others, but there are plenty of opportunities, very accessible, for people to make contacts and access services and activities." (Resp 8, coordinator of initiative B)*

Social cohesion in the community

Trust relationships

Giving informal support is not only related to individual characteristics our analysis shows, but also to characteristics of the community, specifically related to social cohesion. As a cognitive component of social capital, social cohesion is in the literature conceptualized as the collective community-level characteristic that puts an emphasis on norms, trust, and social bonds within the local social structure (Fone et al., 2007; Kawachi & Berkman, 2000). Participants mentioned several characteristics of the community related to social cohesion. First of all, they refered to the importance of trust relationships in the community. According to the residents, trust entails that neighbors are reliable and can be counted on when needed. By treating each other with kindness and respect, trust relationships can be enhanced among residents in the community, which facilitates the motivation to provide support:

> *"I've needed little or no help so far. But I also know, if I needed help... The neighbor next door, he comes faithfully, if I tell him about that boiler, then a filter has to be replaced every now and then…Here my neighbors who are also very nice, have a key to my house." (Resp 16, resident of initiative D)*

Feeling of belonging

Residents also mentioned the importance of feeling of belonging to the community. It refers to the feeling of being part of the larger group, which is the community. The feeling of being a member of the community enhances their motivation to contribute to the community:

> *"And (older people help) precisely because you build a kind of community together, people regain their energy, or feel seen again, or feel useful again, or feel appreciated again. And you shouldn't underestimate what that means, especially for older people, who were somewhat isolated. How people can flourish by indeed being part of a community again." (Resp 1, coordinator of initiative A)*

Feeling of safety

Residents are also more willing to help when they feel safe in the community. Participants mentioned safety in terms of both physical environment and relationships with other residents in the community. On the one hand, a safe community enables residents to go out, creating opportunity to build more connection:

> *"You are safe with each other. I feel that very strongly…I feel safe in community, don't you? It is, people are nice to each other. I've never had anyone come across as unkind to me. Never. And then my sister says, what are you doing walking alone in the woods. But you can. Yes, it is possible here." (Resp 16, resident of initiative D)*

On the other hand, the feeling of security provides opportunities to build tight relationships in the neighborhood:

> *"I feel absolutely safe, because rather a good neighbor than a distant friend. Well, they had my key of course." (Resp 20, coordinator of initiative E)*

Shared values

Last, it is important for residents to have a shared value of doing things together with others in the community, which means an awareness to come together as a group to bring positive change in the local community among residents is needed. It stimulates the obligation to contribute and motivates people to provide support to each other:

> *"We enjoy getting things done for our village. Many people feel the same way. So, that makes the village strong. A powerful community." (Resp 12, resident of initiative C)*

In general, a cohesive community helps to build an environment in which older people are encouraged to help each other. This cohesive atmosphere within the community makes individuals feel comfortable in the community and strengthens their motivation to help and also creates opportunities.

Facilitating resources for informal support provided by the initiatives

All initiatives in our study provided facilitating resources that help to build a supportive environment to strengthen social cohesion in the community and stimulate motivation, abilities and opportunities of older people to support each other. These include a central meeting place, coordinators who help to build support networks, a bottom-up governance structure, an information sharing platforms, and both intra- and inter-organizational collaborations.

A central meeting place
Participants from all initiatives emphasized the importance of a meeting place that provides physical spaces for community activities, which creates the opportunity for older people to get to know each other and build social connections:

> *"If you zoom out for a moment, you can see a precautionary circle between people in the neighborhood, but you can also say, yes, but there must also be a central place that can be connected to." (Resp 23, board member of initiative E)*

Importantly, the physical places help to build a group atmosphere among residents, enhancing a sense of community:

> *"Here in (Initiative A) there are more of these kinds of what we call meeting places… And that also creates a piece of community, but we are a meeting place purely (for our initiative)"South comes together". So there's also a real "South comes Together" atmosphere." (Resp 1, coordinator of initiative A)*

Coordinators
Participants from all initiatives emphasized the importance of a coordinator. Coordinators are sometimes called "village supporters" or "neighborhood assistants", and work as the spiders in the community network. In most cases, coordinators are employees that receive an allowance from the municipality. However, they usually live in the same neighborhood and also work as volunteers in the communities. By getting in touch with residents and inviting them to the meeting place, coordinators help to build social connections among the residents, which facilitates the opportunities for mutual support among older people:

> *"They (coordinators) keep an eye out for individuals who might fall through the cracks. For instance, there are quite a few elderly folks who withdraw and don't open their doors anymore. The neighborhood assistant keeps an eye on that. Then, they'll knock on the door, establish contact, and encourage them to come to the community*

center. And the most important thing is that they help re-establish relationships among the community." (Resp 3, board member of initiative A)

In addition, by visiting households and having daily talks with the residents, the coordinator recognizes residents' available skills and talents as well as residents who are in need, and thus provides opportunities for matching support demand and supply:

"The neighborhood assistants (coordinators) match people up… the neighborhood assistants say well, I know someone else and let's go and have a coffee with them and get acquainted and if it clicks then I'll let that go again. …And then there really was that neighborhood assistant, who was indeed the intermediary and who could say, hey, supply and demand together, so to speak. That wouldn't have happened if that neighborhood assistant hadn't walked around there, because those people live close to each other, but they didn't know anything about each other." (Resp 1, coordinator of initiative A)

A common and important quality of coordinators is that they are familiar with the community and work deeply embedded in the social network of the community. This quality enables them to get access to both the demand and supply side of support, and schedule support resources at the right place and the right time:

"Well, the most important quality of a village supporter is that he knows the village like the back of his hand..... if a lady is bored out of her mind that he has the opportunity to find someone else to become a walking buddy. And they have to be literally and figuratively embedded in the village. So he arranges bouquets of flowers and just goes to visit elderly people." (Resp 10, board member of initiative C)

Bottom-up governance structure

Besides places and coordinators, a bottom-up governance structure is also important. In each initiative, there is usually a board that takes charge of the management of sub-organizations and day-to-day tasks. Board members in these initiatives are usually older residents who live in the community. Notably, most of them are also active informal support givers and contribute as volunteers. In most cases such as Hoogeloon and Apeldoorn, coordinators are also board members. Older people who provide informal support are involved as active members of the sub-organizations within the initiative such as transport group and walking buddy project. This bottom-up governance structure helps to establish trust relationship between residents and organization of initiatives, help to foster a greater sense of community.

"You really have to come from the bottom up…So there really will have to come from the village, from below, from the demand, from the willingness of, it really will have to be picked up." (Resp 11, coordinator of initiative C)

Information-sharing platforms

Initiatives also provide platforms for information sharing in the community. In America, for example, there is an app called "Sido" on which residents can share information. Similarly, Hoogeloon has a newsletter as well as the village website where the dynamics of the villages is very accessible for residents. These information sharing platforms enable older people to have an insight into the ongoing affairs and dynamics in the community, which increases the opportunities for informal support directly. Furthermore, staying consistently informed of community affairs enhances the feeling as a group and belonging to the community. As one participant mentioned:

"And of course we have the initiative app, everyone throughout the village exchanges things with each other. I have a cushion left, can someone use that, I have a pair of shoes in that size left…And then actually quite always a lot of people participate." (Resp 17, resident of initiative D)

Collaboration within and across organizations

Collaboration within and across organizations helps to provide a supportive environment for informal support. These collaborations provide opportunities for residents to learn skills and participate in the community based on their abilities by pooling resources such as training opportunities. Buurtcoöperatie Apeldoorn-South, for example, consists not only of a coordinator and meeting place but also an internship company and "neighborhood academy" that offers training for residents to learn skills (abilities) they can use to support others. Additionally, collaborations with formal care providers create a more integrated support systems, which could be perceived as community resources by residents, which helps to build a stronger sense of community. The America Left Cooperative, for example, runs in conjunction with the internal project "'t Laefhoes" and has signed a contract with the external care organization called "Veil". By doing so, informal support givers can collaborate with formal support professionals to provide support to those in need:

"I'm a village team together with the district nurse, and if there is something wrong in the field of care, not just welfare, I ask her if she wants to take a look. That way I keep very short lines. She has her own care agency, home care, guidance, things like that." (Resp 14, coordinator of initiative D)

It is equally important to ensure clear responsibility boundaries during collaboration. Clear responsibility boundaries can prevent support givers from being overburdened due to providing support, and helps preserve the motivation for sustainable participation:

> *"And I've also noticed in all the volunteer work I've done, they always rely on people who are already doing volunteer work. And then you overburden them and they say stop." (Resp 6, board member of initiative B)*

DISCUSSION

In this study we identified the underlying mechanisms through which community-based initiatives stimulate mutual support among community-dwelling older people, by abductively analyzing perceptions of different stakeholders in five Dutch citizens' initiatives. Although numerous studies have explored the motivation and outcomes of providing informal support among older people and the role of the environment (P. Lu et al., 2021; Xia et al., 2024a), fewer studies have focussed on the mechanisms comprehensively. Our findings reveal that older people are facilitated to provide informal support to community members through a dynamic interplay of factors at the individual, community and initiative level. At the individual level, older people are stimulated to provide informal support when they have and are aware of relevant abilities, are motivated and experience the opportunity to participate in informal support. Social cohesion at the community level strengthens these individual factors, while community-based initiatives contribute by providing a bundle of activities and facilities that stimulate both the individual and the community level.

Consistent with other studies (P. Lu et al., 2021; Zarzycki & Morrison, 2021), we found that on the individual level older people in our study are driven to participate in informal support by the intrinsic motivation of the enjoyment of tasks and helping others (altruism) and by extrinsic motivation such as reciprocity and various forms of rewards. We also found that experienced ability and opportunity can be regarded as important factors at the individual level. Having relevant abilities and the awareness of being capable can benefit one's self-efficacy, meaning a belief in one's capacity to bring positive outcomes (Ryan & Deci, 2000). Having time and connections with others provides opportunities to give informal support. These findings mirror the so-called AMO-model, which is mostly used in HR-research to explain through what mechanisms HR-practices may improve performance(Marin-Garcia & Tomas, 2016). This model posits that individuals' performance is determined by their ability, motivation and opportunity to perform. Performance only occurs when all three elements are present, the level of performance is determined by the level of each dimension (Marin-Garcia

& Tomas, 2016). Therefore HR-practices aim to influence all three, by creating bundles of practices that reinforce each other. This model also seems relevant to explain why people give informal support and to understand how informal support can be stimulated through such bundles of activities and facilities, such as community activities and an accessible community center.

We found that several community level factors may facilitate informal support, including the feeling of belonging, trust, shared values, and safety, which are seen as important elements of neighborhood social cohesion (Chan et al., 2006; Kawachi & Berkman, 2000). These factors are in several ways connected with the individual level factors we identified. A feeling of belonging provides emotional support for residents to stay in the community. Trust within the community and the feeling of safety encourage older people to share their support resources without fear of exploitation. Having shared values and common visions for the community also foster a collaborative spirit. These factors help to create opportunities for individuals to engage with the community they live in, and thus enhance their intrinsic motivation to participate in the community. Previous research revealed a reciprocal relationship between social cohesion and volunteering (Davies et al., 2024). Nevertheless, the impact of social cohesion on informal support provision seems to be stronger than the reverse (Horsham et al., 2024b). Our findings emphasize the importance of investing in social cohesion to facilitate informal support for community-dwelling older people. However, given that our study was conducted in communities with primarily white residents, these findings may not be fully generalizable to more diverse settings or to communities with higher proportions of historically marginalized groups. Research from the US suggests that support exchange among minoritized groups members may be also influenced by other factors such as resistance, survival, which may make them hesitate to participate in community initiatives outside their primary community of belonging (Reyes, 2023). These dynamics may influence the motivation to informal support provision, as well as the effectiveness of initiatives in fostering social cohesion.

We found that the initiatives in this study help to create a supportive environment for informal support by providing a bundle of activities and facilities that influence behavior through both direct and indirect mechanisms (as shown in Figure 2). Direct mechanisms include support arrangements organized by initiatives, such as coordinators who connect people and match informal support demands and supplies, providing opportunities for older people to support each other. Indirect mechanisms include promoting social cohesion within the neighborhood, thus facilitating larger interaction in the community. Both direct and indirect mechanisms involve the individual level factors motivation, ability and opportunity to stimulate informal support. It should be noted that the relationships among factors at different levels can be bidirectional and

non-linear. Initiatives facilitate social cohesion in the community and individual factors, which in turn can promote further development of initiatives by enhancing community participation. These processes seem to reflect the social capital theory, which emphasizes the role of trust, network and norm in the community (Kawachi & Berkman, 2000).

Initiatives not only help to create a supportive environment by encouraging more social interaction, but also foster social capital in the community by enhancing trust relationships and feelings of belonging in the environment. Enhanced social cohesion increases the perception of being part of a larger group, and consequently stimulates individuals to participate in the collective by providing informal support to others. Results highlight the dual role of initiatives on stimulating informal support, both directly and indirectly through enhancement of social capital in the community.

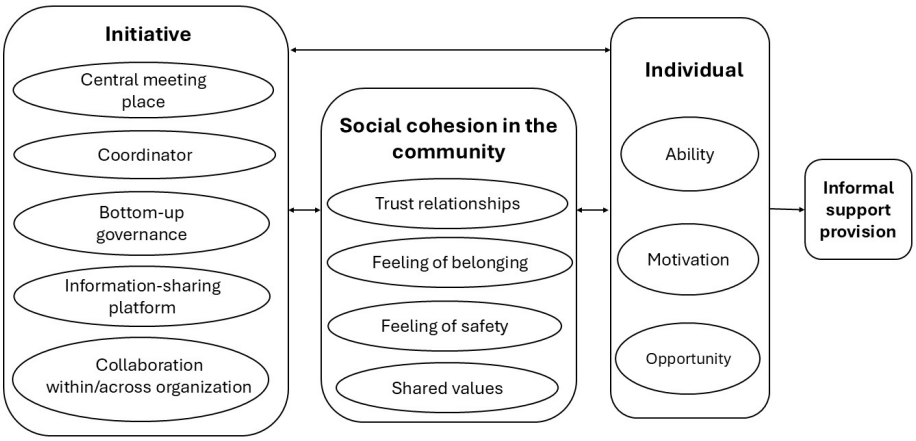

Figure 2. The visualized mechanisms facilitating older people to participate in informal support in the community.

Results of the current study reflect the social-ecological framework which claims the role of factors on multiple levels especially micro- and meso-levels in facilitating informal support and aging in place (Greenfield, 2012; P. Lu et al., 2021). Additionally, this study contributes particularly on two aspects. First, this study introduced a human resource management theory (the AMO model), enriched with factors on individual level. Second, instead of listing factors on different levels separately as in most previous studies (P. Lu et al., 2021; Zarzycki et al., 2023), this study identified the underlying mechanisms that explain the relationships between different levels.

Implications for Practice and Policy

Our findings may contribute to the design and implementation of policies related to aging and aging in place. Policy makers should be aware that bundles of practices are essential to facilitate informal support through factors on different levels. Improving older people's abilities, enhancing their motivation, and providing opportunities for them to engage with the community should be considered simultaneously. In addition, interventions and community programs stimulating informal support are worth investing in, given they can help to build a cohesive environment and to enhance social connections, which can ultimately facilitate older people to take the action to participate in informal support.

It is worth noting that rather than advocating for complete substitution of public sector involvement, our findings underscore the need for policies that support informal care through complementary processes, which work in tandem with formal care systems. There is a concern that calls to promote informal support by older people themselves might shift the responsibility for care provision from the public sector to communities and individuals with insufficient resources, thereby perpetuating injustices (Martinson & Minkler, 2006). Informal support should not be seen as a substitute for formal care but rather as a way to enhance the overall support system. The initiatives we studied provided a supportive environment that complemented formal care services by building social cohesion and facilitating connections among older adults. This approach ensures that the burden of care does not fall solely on individuals or communities but is shared and supported through coordinated efforts. By investing in such initiatives and promoting policies that strengthen both formal and informal support structures, it is possible to avoid the potential pitfalls of devolution, thus creating a more equitable and effective care environment for older adults.

Limitations

Several limitations need to be taken into account in this study. First, the older people acting as respondent were recruited from community organizations through initiative coordinators to maximise the feasibility. Older people who had less interaction with the community might therefore have been missed for the interviews. Second, whether the mechanisms apply to different contexts should be further investigated in future studies. We were not able to include participants with ethnic and migrant backgrounds, further studies could involve more ethnically diverse communities and participants. Despite these limitations, this study contributes to the topic of informal support in the community by deconstructing the mechanisms at and between the multiple levels in the

context of community-level practice that enable older people to participate in informal support provision.

Conclusions

Given the rapid shift of global demographics, the increasing pressure on the healthcare budget, and the sustained interest in age-friendly interventions in the community, clarifying the mechanisms of community-based informal support on both individual and community level is important. This study reinforces the importance of stimulating informal support by focusing on multi-level factors, including the combination of ability, motivation and opportunity on the individual level, social cohesion on the community level, and facility support provided by initiatives on the organizational level. These findings are essential for further development of practical efforts to promote neighborhood informal support in the community, thus fostering aging in place. Empirical findings of this study support the idea of environmental gerontology and emphasize the beneficial role of community organizations in facilitating individual support behavior, which can be referred to by policymakers and practitioners.

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SUPPLEMENTAL MATERIALS

Supplemental Table 1. Characteristic dimension for initiative selection.

	Rural	Urban
Neighborhood-based	Zorgcoöperatie Hoogeloon Vitality Cooperative America Left	Buurtcoöperatie Apeldoorn-South
Household-based	Austerlitz Zorgt	Humanitas Deventer

Supplemental Table 2. Themes and Example Quotes from the Interviews.

Levels	Secondary themes	Primary themes	Initial codes	Sample Quotes
Individual	Motivation	Altruism	Help for make others benefited	*"To help and support others. And by helping others, you see that someone else's situation improves…So, it's an inner drive to do something for others, to help others. That's where the motivations lie." (Resp 12, resident of initiative C)*
			Like seeing others happy	*"I just do a lot of volunteer work here. I like it. I've always done it and I like it. And I see that people are happy about it. And then you will be happy yourself. That's just very true." (Resp 21, resident of initiative E)*
		Being useful and feeling meaningful	Happy because help means something for others.	*"That makes me happier. Honestly. It really makes me happier. To also be able to mean something to someone else." (Resp 19, board member of initiative D)*
			Feels meaningful despite of disability	*"At the moment I'm disabled, I don't have any voluntary work so I notice that I'm disappointed that I can do less for society. So, with little things like this I kind of feel like I do something and mean something. And uhm.. that I'm not just surviving so to speak" (Resp 16, resident of Initiative D)*
		Enjoyment of doing the support task itself	Help driving people because of the enjoyment of driving	*"I think that's more the intrinsic motivation than the enjoyment of driving itself…I simply enjoy driving. No doubt about it." (Resp 9, resident of initiative B)*
			Feel happy and active for performing the best	*"That's where I'm at my best I think. Yes, I enjoy it, it makes me happy, it makes me active." (Resp 20, coordinator of initiative E)*

Supplemental Table 2. Continued

Levels	Secondary themes	Primary themes	Initial codes	Sample Quotes
		Reciprocity	It is important to have reciprocal relationships	*"I think it's just something... When you give something to someone, you also get something back. Yes. And if you only take, then you get.... Then you can't give anything back either. No. I just think it's important that there is a reciprocal relationship." (Resp 11, coordinator of initiative C)*
			Preparatory reciprocity	*"What I just said, to still think of if we do it, maybe others will do it for us too… I don't actually need it yet, but I think if necessary, I can fall back on them. I do have that feeling." (Resp 4, resident of initiative B)*
	Ability	Realizing skills and abilities being relevant	Professional training facilitates to do things	*"I come from an education background and I've given and developed many courses during my work. And I simply enjoy it. So helping people, it's in an area that I'm proficient in." (Resp 9, resident of initiative B)*
			Help reading papers because being able to	*"Well, I like reading the newspaper, because if I can read the newspaper to a lady who can no longer read, I can do that, so to speak." (Resp 10, board member of initiative C)*
	Opportunity	Time	Having time after retirement	*"Most of the volunteers I have are of course the elderly. These are retired people who suddenly have a lot of time and they really enjoy doing volunteer work." (Resp 14, coordinator of initiative D)*
			Older people have time to make investment	*"Well, they are on the one hand, they are on average mostly elderly people, so also people who have that time, who also in part maybe make this kind of investment." (Resp 10, board member of initiative C)*

Supplemental Table 2. Continued

Levels	Secondary themes	Primary themes	Initial codes	Sample Quotes
		Socially connected	Recognizing each other's ability	*"People discover from each other that you have certain skills and dexterity in something and that people then say, well then, if you have a job to do I can help you. And indeed, the idea of people going shopping together. Yes. And so people who, just little networks of people who wouldn't have met otherwise are created. And who now get together and support each other." (Resp 1, coordinator of initiative A)*
			Connection facilitates awareness of needs	*"You're more in touch with each other and then you also see more of what's going on and then you also care sooner. Yes. If someone needs help you can also jump in together." (Resp 4, resident of initiative B)*
		Being invited and free to participate	Do because wants to do by oneself	*"Whether you want it or not, it won't work and it won't succeed. So that's easy. But if there are people who want to do it, then it will work. The most important thing is that there are people who do it because they want to." (Resp 3, board member of initiative A)*
			Voluntary basis facilitates participation	*"I think that's also because everything is on a voluntary basis, no one is forced to do anything." (Resp 14, coordinator of initiative D)*
Community	Social cohesion in the community	Trust relationships	Respect builds trust relationship	*"By treating others with respect, you also build a form of trust in each other. And I think that's the basis of getting along well with each other, that people trust you." (Resp 12, resident of initiative C)*
			Mutual trust among residents	*"But trust is the most important thing. Look, they need to trust us that we won't do anything bad to them. And we need to trust them that they find it enjoyable and pleasant that we're doing it." (Resp 5, resident of initiative B)*
		Feeling of belonging	Feeling happy for being part of the group	*"They took me in and I'm happy to be part of it. That's how I feel." (Resp 17, resident of initiative D)*

Supplemental Table 2. Continued

Levels	Secondary themes	Primary themes	Initial codes	Sample Quotes
			Belong through help	*"I'm glad that I've been doing this (helping) because, despite my visual impairment, I still feel like I belong." (Resp 13, resident of initiative C)*
		Feeling of safety	Feeling safe living in the community	*"I say, I feel safe in Austerlitz, don't you? It is, people are nice to each other. I've never had anyone come across as unkind to me. Never. And then my sister says, what are you doing walking alone in the woods. But you can. Yes, it is possible here." (Resp 16, resident of initiative D)*
			Feeling safe living with neighbors	*"Absolutely (feel safe), because rather a good neighbor than a distant friend. Well, they had my key of course. Another family, by the way. And when things weren't going well, I was allowed to call at night." (Resp 20, coordinator of initiative E)*
		Shared value of doing things together	Collective identity of togetherness	*"So there's also a real South does Together atmosphere… I think that is, certainly for a large group of people, one of the reasons they come to us and not somewhere else. Because they're just really part of that community." (Resp 1, board member of initiative A)*
			Achieve more by doing things together	*"Because often, you have people sitting in different places, doing different things. And when you work together, you can achieve more and spend less time setting everything up" (Resp 6, board member of initiative B)*
Initiative	A central meeting place	Meeting place	Importance of the infrastructure to meet each other	*"You really need a place where you can meet. A village hall, a sports canteen for all I care. You must have that. That is an infra-structural condition. If you have such a place, yes then you have to organize activities. And that happens automatically because if you have a building, you don't want to leave it empty." (Resp 15, board member of initiative D)*

Supplemental Table 2. Continued

Levels	Secondary themes	Primary themes	Initial codes	Sample Quotes
			Meeting places enhance the sense of community	*"Here in (the neighborhood) there are more of these kinds of what we call meeting places…And that also creates a piece of community, but we are a meeting place purely from Zuid doet Samen. So there's also a real South does Together atmosphere and it's a South does Together atmosphere." (Resp 1, coordinator of initiative A)*
		Central location in the community	Central location to aware support needs	*"And because we are all in the middle of the village, you know what is happening in the village and whether anything is needed." (Resp 14, coordinator of initiative D)*
			Central hub for community life	*"Everything happens from here, so it really is the central point. The gym, the school! The children also come here and parents also meet again in the schoolyard. This is really the central point." (Resp 14, coordinator of initiative D)*
	Coordinators	Help building social connections	Help to build contact among residents	*"She (coordinator) says, can you do this or that. And that's how you get some contacts. I'm not the type to easily go anywhere..." (Resp 17, resident of initiative D)*
			Building connections among residents	*"The neighborhood assistants (coordinators) match people up. That wouldn't have happened if that neighborhood assistant (coordinator) hadn't walked around there, because those people live close to each other, but they didn't know anything about each other." (Resp 1, coordinator of initiative A)*
		Matching support demand and supply	Monitoring needs among residents	*"They keep an eye out for individuals who might fall through the cracks. For instance, there are quite a few elderly folks who withdraw and don't open their doors anymore. The coordinator keeps an eye on that. Then, they'll knock on the door, establish contact, and encourage them to come to the community center." (Resp 3, board member of initiative A)*

Supplemental Table 2. Continued

Levels	Secondary themes	Primary themes	Initial codes	Sample Quotes
			Personalized matching demand and supply	*"So the one who hear the stories on the street and they actually have there and that is stored and it could be that someone else streets away who is having the same issue but on the demand side. And then the neighborhood assistants say well, I know someone else and let's go and have a coffee with them and get acquainted and if it clicks then I'll let that go again. …And then there really was that neighborhood assistant, who was indeed the intermediary and who could say, hey, supply and demand together, so to speak." (Resp 1, coordinator of initiative A)*
	Bottom-up Governance structure	Bottom-up Governance structure	Importance of bottom-up approach	*"You really have to come from the bottom up. You can't pick up something and copy it in another place and say, so this is it and start it. So there really will have to come from the village, from below, from the demand, from the willingness of, it really will have to be picked up." (Resp 11, coordinator of initiative C)*
			Bottom-up organization enables empowerment through ownership	*So really organised close to the people and from the bottom up. So that you really say, yes, residents regain some kind of ownership of their own environment." (Resp 1, coordinator of initiative A)*
	Information sharing platforms	Information sharing platforms	Informing the community through the newsletter	*"And one of the activities I'm also involved in is a village newsletter…You can put a lot of things in there. I also include information about dementia and all sorts of things. But by doing that, you inform people well, and it's really well read by the elderly." (Resp 12, resident of initiative C)*
			Use of APP promotes community exchange	*"And of course we have the Austerlitz app, everyone throughout Austerlitz exchanges things with each other. I have a cushion left, can someone use that, I have a pair of shoes in that size left..." (Resp 17, resident of initiative D)*

Supplemental Table 2. Continued

Levels	Secondary themes	Primary themes	Initial codes	Sample Quotes
	Collaboration within and across organizations	Internal collaborations	Collaboration within organization makes work effective	*"I focus on the bigger picture, setting the vision and so on. I also work closely with Sjan, and it works very well. We're quite different, but together, it's very effective." (Resp 6, board member of initiative B)*
		Cross-sectoral collaborations	Collaboration with the district nurse make efficient response to needs	*"I'm a village team together with the district nurse, and if there is something wrong in the field of care, not just welfare, I ask her if she wants to take a look. That way I keep very short lines. She has her own care agency, home care, guidance, things like that." (Resp 14, coordinator of initiative D)*

Supplemental overview of cases

Zorgcoöperatie Hoogeloon

The Zorgcoöperatie Hoogeloon is a healthcare cooperative in the municipality of Hoogeloon in the province of North Brabant. The initiative was built since 2005 and was the pioneering care cooperative in the Netherlands. The cooperative has been providing various service for residents with various conditions from mild to severe within the village, including care, meals, accommodation and so on, based on voluntary work. In addition, there are two village supporters (coordinator) who works to help residents coping with various issues related to the community. There is an activity center in Hoogeloon, where daytime activities are organized by volunteers from the care cooperative and two professionals from the outside care organization. For meals, a cooking group made of volunteers cook meals for the older people who live in Hoogeloon every Tuesday. Except organizing social support, the cooperative collaborates with Joris Zorg, which is the professional care organization, with a professional healthcare team to provide home care for residents. In addition, there are two care villas in the village to care for older people with a diagnosis of dementia and an appropriate indication. By participating in the Joris Zorg client council, residents are able to exchange information with a client council representation with healthcare professionals are involved.

Vitality Cooperative America Left

America is a village located in the municipality of Horst aan de Maas in the province of Limburg, with the population of around 2,300 people. The America Left in America is a care cooperative aiming to promote a vital community and prevent professional care as much as possible. The America Left provide a platform to support America's residents helping each other voluntarily. The cooperative organizes various activities include helping with tasks in and around the house, finding a buddy for daily activities such as walking or cycling, volunteer work, and consultancy of care-related questions. Activities are arranged with the coordination of two village supporters (coordinators). All board members of the cooperative are volunteers. Working together with professionals, volunteers in America Left provide care and welfare services as integrated as possible. Additionally, the 't Laefhoes in America is a meeting place for professional healthcare with various participants. In the building, there is a public living room, a kitchen and a garden for all residents of America and surrounding areas.

Buurtcoöperatie Apeldoorn-South

Buurtcoöperatie Apeldoorn-South is a neighborhood cooperative located in Apeldoorn, a city located in the province of Gelderland with population of approximately 30,000 residents. Based on the background of the Social Support Act (WMO) of the Netherlands, where citizens and their personal network need to hold responsibilities for care, the cooperative has been established in 2013 to support mutual support for residents. It is an umbrella organization that consists of four distinct functional branches. The first branch is the neighborhood assistants (coordinators) who work in each neighborhood in Apeldoorn. The second branch is a meeting place called "Ons Honk", where residents come to socialize and where day care services are provided. Besides, an internship company is running in the cooperative where people from ROCs (Regional Training Center) or students from social studies come for training. Last, there is a branch called "neighborhood academy" that offers courses or lessons to invite residents to participate. Additionally, there is a new branch has been built called "locomotive", aiming to offer guidance to people who are re-entering the labour market.

Apeldoorn South was separated into several smaller neighborhoods. The neighborhood assistant (coordinator) was employed by the cooperative and works for each neighborhood.

Austerlitz Zorgt

Austerlitz is a village located in the province of Utrecht with about 1,800 residents. The Austerlitz Zorgt is a care cooperative in the village, where mutual informal support is village-wide implemented. The Austerlitz Zorgt was established in 2012, aiming to improve the quality of life and support independent living among residents. A village supporter (coordinator) to whom everyone can ask questions and support from neighbors in handling small tasks helped on the volunteering arrangements. With the coordination of the coordinator, various services for residents including shopping, transport, meal provision, garden maintenance, domestic help and so on, are organized. Almost all these services are provided by volunteers who are mainly older residents of Austerlitz. The organization also collaborates with professionals such as district nurse to provide healthcare services. In addition, there is a community center in the center of the village, where many groups and activities in which residents can participate are organized. One must pay dues and be a member of the Austerlitz Zorgt to participate. Notably, nearly all residents aged 18 and above are members.

Therefore, by listening to the needs of residents, more and more clubs are formed and their needs are met. Furthermore, initiatives such as the Austerlitz Rijdt (where a person drives someone somewhere) are based on voluntary work. More than 100 volunteers help with small tasks and support fellow Austerlitz residents through voluntary work.

Humanitas Deventer

Humanitas Deventer is a residential care center for older people with needs of support, located in Deventer, which is a city in the province of Overijssel. It is a household-based initiative consisting of three buildings. One is called Ludgerus which consists of 300 apartments and provides basic care. Only people who meet the profile can get such an apartment. Older people will move to a nursing home if they need day-to-day care, so that they can live independently. The other is an 11-storey unit, which has become a 55-storey or above unit since November of 2022. Here the Voorzorgcirkels initiative is in full swing to increase and stimulate mutual support. Finally, the main building of Humanitas Deventer organizes activities where residents can meet each other and build connections. Although there are also coordinators in the Humanitas Deventer, they are also the residents and do coordinating tasks voluntarily. A unique characteristic of Humanitas Deventer is that students can rent several apartments free of charge on the condition that they do their best to help the older people. By doing this, Humanitas Deventer integrates young people into their main building and creates a cross-generational building.

CHAPTER 5

Relationships between support provision, social cohesion and well-being among community-dwelling older people: a longitudinal survey study

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ABSTRACT

Objectives

Although providing support to others and cohesive community environment are both considered beneficial to older people's well-being, the pathway through which they affect well-being has rarely been studied. This study aimed to examine the underlying relationship between support provision, social cohesion and belonging, and well-being among community-dwelling older people.

Methods

A longitudinal survey study design was employed. Data were collected among community-dwelling older people in the Netherlands in two waves with a six-month time interval. Multivariate linear auto-regressions and cross-lagged panel models were used to explore the relationships between support provision, social cohesion and belonging, and well-being.

Results

Controlling for covariates, support provision, social cohesion and belonging were positively associated with the increase of well-being. Cross-lagged analysis found no reciprocal relationships between on the one hand support provision and on the other hand social cohesion and belonging; social cohesion was positively associated with an increase in support provision and not vice versa. However, there were no associations between belonging and support provision . No mediating relationships were observed.

Discussion

Our study found different effects of social cohesion and belonging in facilitating older people's participation in support provision. Building a cohesive community environment is worth the investment, as it can facilitate older people's participation in mutual support and increases well-being.

INTRODUCTION

In recent years, the active aging agenda has increasingly promoted a positive view of aging, emphasizing that older people can remain active participants within their communities (Beard et al., 2016; Boerio et al., 2023). As a response, many countries are developing community-based initiatives to facilitate mutual support among older people in the community (De Wit et al., 2017; Sudo et al., 2018; Xia et al., 2025). The underlying assumption is that facilitating mutual support in the community not only alleviates the financial strain on healthcare systems but also creates opportunities for older people to remain active and live independently within their communities, ultimately benefiting their well-being (Rudnicka et al., 2020). However, there remains a substantial knowledge gap regarding how participation in mutual support within the community interacts with community-level factors and ultimately affects well-being. This study aims to address this gap by exploring how older people's perceptions of their community interact with their support behavior and ultimately influence well-being. In this study, we adopt a broad definition of community-based mutual support, as the support provision behavior, encompassing a wide range of supportive behaviors provided to non-relatives within the neighborhood (Siira et al., 2022). Social cohesion and belonging, as the key social characteristics of the community, serves as the indicator in this study related to people's perception of their communities.

Support provision and well-being

The active aging perspective emphasizes that older people are valuable members of society who can contribute to their communities. Engaging in prosocial activities, such as helping others, is believed to facilitate a healthier and more active aging process (Kahana et al., 2013). According to self-esteem enhancement theory, individuals have a basic drive to maintain positive self-worth and receive positive evaluations from others (DuBois et al., 2009). Providing help to others, particularly to those outside one's family, appears to be more beneficial than only receiving help from others, as offering support fosters a sense of self-worth and independence (Thomas, 2010b; Väänänen et al., 2005). This positive influence of support provision is particularly significant for older people, as the life-span perspective highlights that older people are at higher risk of self-esteem decline (Uchino, 2009). Providing support to non-relatives reinforces their ability to contribute to society, enhancing their feelings of confidence. A recent study shows that when older people provide more support to non-relatives than receive, they experience a higher level of subjective well-being, aligning with the self-esteem enhancement theory (Xia et al., 2024b).

Social cohesion, belonging, support provision and well-being

The goal of active aging policies is to enable older people to stay in their familiar community for as long as possible, highlighting the importance of the community environment. (Greenfield et al., 2016; Lum et al., 2016; Nieboer & Cramm, 2018). Social cohesion is the key characteristic of the social environment of a community, which plays important roles in shaping older people's behavior and psychosocial health (Horsham et al., 2024a; Kim & Kawachi, 2017). It is usually identified by the communal bonds with altruism, reciprocity, and sense of belonging (Kawachi & Berkman, 2000). While social belonging has been frequently conceptualized as part of the concept of social cohesion, Fone (2007) found that belonging should be measured separately from social cohesion. Therefore, in this study, we treat social cohesion and belonging as distinct but related concepts, which are measured separately but considered in parallel as indicators of the social environment of the community. According to the social-ecological theory, older people's behavior and well-being are determined not only by their personal characteristics but also by how they interact with the environment (Greenfield, 2012). Perceived social cohesion and belonging in the community and be viewed as social support from the community, which can benefit well-being by facilitating access to health-related resources such as healthcare services (Kim & Kawachi, 2017). Additionally, social cohesion and belonging may influence well-being through enhancing trust and emotional security, which is particularly important for older people, as they face higher risk of social isolation (Siira et al., 2022).

While a cohesive community environment is important for older people's behavior and well-being, it is unclear how it interacts with older people's participation of mutual support in the community and their well-being. One reason for this knowledge gap is that previous research often incorporated the support provision behavior within the broader conceptualization of social cohesion (Carrasco & Bilal, 2016; Kawachi & Berkman, 2000). However, these studies usually include support that individuals perceive from their neighborhood rather than the support they actively provide to others. We propose that while receiving and providing support are interconnected, they should be examined separately. This distinction is important because support flows in opposite directions between receiving and giving, which can be driven by different motivations, and thus yield varied outcomes. Including support provision within the definition of social cohesion may confound with its causes or outcomes (Jenson, 2010). Therefore, we propose that the behavior of support provision be treated distinctly from social cohesion. The act of support provision itself is not intrinsically cohesive but can influence and be influenced by social cohesion.

As the social-ecological theory suggested, individual's psychosocial outcomes are determined by the dynamic interactions between individual actions and community conditions. On the one hand, a cohesive neighborhood provides a supportive environment where community members trust their neighbors and feel safe with each other, reinforcing positive social norms such as being active and contributing for the community, and thus facilitates older people's participation in productive activities (Latham & Clarke, 2018; P. Lu et al., 2021). Therefore, perceptions of social cohesion and belonging may encourage older people to participate in productive community activities such as providing support to the neighborhood, thereby enhancing well-being. On the other hand, active participation in providing support to others contributes to building strong support networks, thus enhancing social cohesion and belonging by strengthening the social connections and reciprocal social norms in the community, thereby improving well-being (Kim et al., 2020). A recent study found that social cohesion and belonging in the community facilitates older people's support provision to the community, while the support behavior can, in turn, enhance neighborhood social cohesion (Xia et al., 2025). Similarly, Davis and Horsham (2024) found reciprocal relationships between social cohesion and volunteering.

Understanding how support provision interacts with social cohesion and belonging to influence older people's well-being is not only of academic interest but also important for the design of interventions to promote active aging. By examining whether support provision mediates the relationship between social cohesion and belonging, and well-being or vice versa, this study will provide evidence on whether it is more effective to promote support behaviors directly or strengthen social environments to stimulate individual action. There is no direct evidence on the mechanism through which support provision and social cohesion interact to influence well-being. Previous studies suggest that support provision might be the mechanism through which social cohesion influences well-being. Davies and his colleagues (2024; 2024) found that the impact of social cohesion on volunteering was stronger than the reverse, highlighting the potential of community environment in shaping individual behaviors.

Research aim

While community-based initiatives try to facilitate mutual support, how this actually affects older people's participation in support provision and thus influence their well-being is less understood. Guided by the social ecological framework and using a time-lagged study design, this study will examine the bidirectional associations between support provision and social cohesion and explore whether one helps explain the effect

of the other on well-being. **Figure 1** illustrates the conceptual framework of this study. Specifically, this study proposes the following hypotheses:

Hypothesis 1: Support provision within the community will be positively associated with well-being among community-dwelling older people.

Hypothesis 2a: Social cohesion will be positively associated with well-being among community-dwelling older people.

Hypothesis 2b: Social belonging will be positively associated with well-being among community-dwelling older people.

Hypothesis 3a: The relationship between support provision and social cohesion will be reciprocal.

Hypothesis 3b: The relationship between support provision and social belonging will be reciprocal.

Hypothesis 4a: Social cohesion will mediate the relationship between support provision and well-being.

Hypothesis 4b: Social belonging will mediate the relationship between support provision and well-being.

Hypothesis 5a: Support provision will mediate the relationship between social cohesion and well-being.

Hypothesis 5b: Support provision will mediate the relationship between social belonging and well-being.

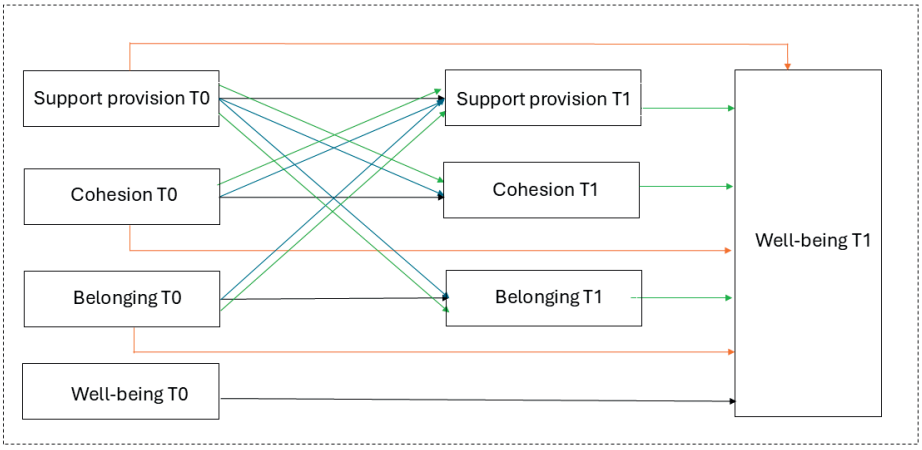

Figure 1. Conceptual framework of this study. Hypotheses 1, 2a and 2b are presented in orange. Hypotheses 3a and 3b are presented with blue lines. Mediation hypotheses (4a, 4b, 5a and 5b) are presented in green.

METHODS

Data

Data for this study were collected through the Longitudinal Internet Studies for the Social Sciences panel (LISS), which is a probability-based online panel comprising over 6,500 individuals from about 4,700 households, selected from the Dutch population register (https://www.lissdata.nl/). Participants of this panel are invited voluntarily to complete a monthly web-based questionnaire, with monetary compensation. Household and respondent demographics are updated monthly.

The LISS panel abides by the European "General Data Protection Regulation (GDPR)" and complies with all relevant ethical regulations. LISS panel participants give informed consent for the use of the collected data in scientific and policy-relevant research. Meanwhile, this study was also approved by the Ethics Review Committee of the Erasmus University Rotterdam (application number ETH2324-0560).

Panel members aged 65 and above at the first wave of data collection were invited to fill in the questionnaire in July 2024 for wave 1 and in January of 2025 for wave 2. Data collection in wave 1 generated 734 responses, with 732 participants completing the questionnaire (94.5% response rate). Among those, 677 participants who completed the questionnaire of wave 1 joined the data collection in wave 2, of which 675 (93.8%) completed the questionnaire the second time.

Measures

Well-being

The 15-item version of the Social Production Function Instrument of the Level of Well-being (SPF-IL; see Supplement Materials for complete version) was used to measure well-being (Frieswijk et al., 2006; Nieboer et al., 2005). This scale was developed from the social production function (SPF) theory, which posits that individuals strive to maintain well-being by fulfilling physical and social needs. It has been validated and proved to be reliable in the Dutch older population (Cramm et al., 2013). The response category ranged from "Never (1)" to "Always (4)". The well-being score was assessed as the averaged value of all items, with higher scores indicating better well-being. Cronbach's alpha values of the SPF-IL in this study were 0.85 at T0 and 0.83 at T1, indicating good reliability.

Support provision

As mutual support in the community could be seen as a complex concept that covers various helping behaviors, this study assessed support provision as participants' participation in a wide range of support tasks including both instrumental support and emotional support (Siira et al., 2022). Participants were firstly presented with the main question "In this section, questions will be asked about your experiences with helping people in your neighborhood, that are not your kin. Think about the last 6 months. How often have you given support or helped someone in other ways, who is NOT a family member?" Activities available that could be selected were: 1) volunteering without payment; 2) support with personal care; 3) support with household chores; 4) support with paperwork 5) support with technology 6) financial support, and 7) emotional support. Participants were asked to choose the frequency they have participated in each activity from "Never (0)" to "Almost every day (4)". Frequencies for each activity were summed up to operationalize the intensity of support, a higher score indicating higher levels of support density.

Social cohesion

Instead of measuring social cohesion as a unidimensional concept like many previous studies (Buckner, 1988), this study uses the modified scale by Fone and colleagues (2007), that identified and measures cohesion and belonging as two subscales of social cohesion. This instrument has been used cross-culturally with good validity and reliability in the Netherlands (Cramm et al., 2013; Elliott et al., 2014; Fone et al., 2007; Yu et al., 2019). The scale consists of an 8-item cohesion sub-scale and a 7-item sub-scale of belonging. For the sub-scale of cohesion, participants were asked about their experience within the neighborhood they live in. Examples items are: "If I needed advice about something, I could go to someone in my neighborhood", "I borrow things and exchange favors with my neighbors", and "I would be willing to work together with others on something to improve my neighborhood". Example questions for the belonging sub-scale were: "I am attracted to living in this neighborhood" and "I feel like I belong to this neighborhood". All items were measured on a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). Items were summed up to create the score of cohesion and belonging, with a higher score indicating a higher level of social cohesion, which is in line with other studies (Cramm & Nieboer, 2015). Cronbach's alpha values of the cohesion were 0.850 at T0 and 0.842 at T1, and for belonging were 0.841 at T0 and 0.852 at T1, indicating good reliability.

Covariates

We included background characteristics at T0 that have shown to affect social cohesion and well-being in previous studies (Davies et al., 2024; Latham & Clarke, 2018; Van Dijk et al., 2013a). Age and years of residence were treated as continuous variables. Income was measured as the log-transferred gross household income in euros. Self-rated health was measured ranging from poor to excellent and treated as a continuous variable (Van Tilburg et al., 2021). Gender was dichotomized as male versus female, and ethnic background as Dutch versus non-Dutch. Living arrangement was coded as a dummy variable of single versus co-habitation with partner and/or child(ren). Education level was categorized into low, medium, and high levels.

Analytic Strategy

We conducted a non-response analysis. T-tests and Chi-square tests were used to compare baseline characteristics of 675 participants who completed questionnaires in both waves to those who only participated in the first wave.

Bivariate correlations were tested to explore the correlations among variables. Multivariate linear auto-regressive analyses were conducted to examine the unidirectional association between support provision at T0 and wellbeing at T1, as well as the unidirectional relationship between social cohesion at T0 and well-being at T1. In each model, well-being at T0 was auto regressed. A multicollinearity test indicated that no multicollinearity exists among variables (VIF ranges from 1.031 to 3.581).

A cross-lagged panel modelling (CLPM) approach based on structural equation modelling (SEM) was applied to examine the hypotheses regarding reciprocal relationship and mediation. The CLPM approach evaluates the relationships among variables that measured repeated assessments on different timepoints (Allen, 2017). Under the assumption of synchronous measurements and stationary relationships, the CLPM allows to examine the reciprocal and longitudinal relationships among variables (Selig & Little, 2012). Additionally, compared to the mediating examination in cross-sectional data, the cross-lagged design takes account of the temporal sequence of measured variables as well as autoregression of measured variables simultaneously, which is more suitable for estimating for the potential causal effect (Cole & Maxwell, 2003). This study used data from two timepoints (T0 and T1) with a six-month interval to test the time-lagged effect. Covariates are measured at baseline and regressed on key variables at T1. The cross-lagged mediation effect is estimated by examining the indirect pathway from the independent variable at T0 to the dependent variable at T1 through

mediator variables at T1, through the coefficient product method. Confidence intervals (CIs) based on 5,000 replications were calculated using a bootstrap resampling method.

Following the recommendation of Hu and Bentler (1999), several fit indices were used to assess the model fit, including the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), and the comparative fit index (CFI). A CFI value greater than 0.95 is considered as an excellent model fit, although values greater than 0.90 are considered acceptable (L. Hu & Bentler, 1999). RMSEA and SRMR values of 0.06 or lower are considered to reflect a good fit, while values up to 0.08 are considered acceptable.

Analyses were performed using the Lavaan package in R (version 4.1.2; R Development Core Team) within the RStudio platform. Maximum likelihood estimation was used to handle any non-normality in the sample. While missing values only exist in covariates, we use the full-information maximum likelihood (FIML) technique to account for missing values, which has been shown to be an efficient method of dealing with missing data compared with traditional imputation (Enders & Bandalos, 2001).

RESULTS

Demographic Characteristics and Correlations

Table 1 provides descriptive characteristics of variables from both waves. Participants in the first wave were aged from 65 to 96 years with a mean age of 73.81 (SD=5.814) years. Approximately half of the participants were males (52.869%). Almost 70 percent of the participants cohabitated with a partner and/or children (69.130%). Most of the participants were from a Dutch ethnic background (88.243%). Characteristics of the sample represent the Dutch population well (Statline, 2024). Comparisons of the baseline characteristics of participants who completed questionnaires of both waves to those who only participate in the first wave showed no significant difference, indicating no dropout bias in this study (see Supplemental Materials). Participants have resided in their neighborhood for an average of 28.012 years (SD=16.922).

Table 1. Descriptive statistics of participants in both waves

Variable	T0 (N=732)		T1 (N=675)	
	%/range	Mean (SD)	%/range	Mean (SD)
Age	65-96	73.807 (5.814)	65-96	73.799 (5.732)
Gender				
Male	52.869		53.926	
Female	47.131		46.074	
Living arrangement				
Single	30.870		30.538	
Cohabitation with partner and/or child(ren)	69.130		69.462	
Education level				
Low	32.148		32.195	
Medium	30.232		30.119	
High	37.620		37.685	
Self-rated health	1-5	3.014 (0.838)	1-5	3.058 (0.862)
Ethnic groups				
Dutch	88.243		88.243	
Other	11.757		11.757	
Income	0-4.570	3.564 (0.401)	0-4.332	3.566 (0.412)
Years of residence	0-80	28.012 (16.922)	0-80	28.473 (17.355)
Support provision	0-28	3.342 (3.584)	0-28	3.492 (3.847)
Cohesion	8-40	27.160 (5.577)	9-40	27.250 (5.549)
Belonging	9-35	27.742 (4.101)	11-35	27.964 (4.232)
Well-being	1-4	2.599 (0.423)	1-4	2.648 (0.406)

Results of univariate analyses show that all key variables are positively correlated with each other, as indicated in **Table 2**. Correlation analyses show that both age and gender were not significantly associated with either support provision, social cohesion, or well-being ($p > 0.05$). Income was positively associated with social cohesion ($r = 0.085$, $p < 0.05$ at T0, $r = 0.140$, $p < 0.001$ at T1) but not belonging, support provision, nor well-being. Higher education levels were associated with higher levels of support provision ($r = 0.114$, $p < 0.01$ at T0, $r = 0.132$, $p < 0.001$ at T1) and well-being ($r = 0.128$, $p < 0.001$ at T0, $r = 0.104$, $p < 0.01$ at T1). Co-habiting with partner and/or children, and having higher levels of self-rated health were associated with higher levels of cohesion, belonging, and well-being ($p< 0.001$).

Table 2. Correlation matrix of key variables

	Support provision		**Cohesion**		**Belonging**		**Well-being**	
	T0	**T1**	**T0**	**T1**	**T0**	**T1**	**T0**	**T1**
Support provision								
T0		0.587***	0.325***	0.257***	0.148***	0.107**	0.205***	0.169***
T1			0.286***	0.318***	0.147***	0.098*	0.186***	0.244***
Cohesion								
T0				0.803***	0.458***	0.406***	0.481***	0.404***
T0					0.43***	0.484***	0.447***	0.47***
Belonging								
T0						0.758***	0.458***	0.401***
T1							0.404***	0.432***
Well-being								
T0								0.711***
T1								

Notes. Correlations among key variables were tested with Pearson correlation statistics.

Results of the linear regressions

The results of the unidirectional associations between support provision, social cohesion and well-being with auto-regressive analyses are shown in **Table 3**. After controlling for well-being and background characteristics at T0, support provision at T0 was associated with a small increase of well-being ($\beta = 0.066$, p = 0.023, 95% CI: [0.001, 0.014]). Similarly, social cohesion ($\beta = 0.118$, $p < 0.001$, 95% CI: [0.004, 0.013]) and belonging ($\beta = 0.097$, $p = 0.003$, 95% CI: [0.003, 0.016]) at baseline were both associated with a higher level of well-being later on, although the effect sizes are small. Results of the auto-regressive models confirm the first and the second hypotheses.

Table 3. Results of linear auto-regressive models

Variable	Well-being T1								
	Model 1			Model 2			Model 3		
	B (SE)	*β*	95% CI	B (SE)	*β*	95% CI	B (SE)	*β*	95% CI
Age	0.003* (0.002)	0.042	[-0.001 0.007]	0.003 (0.002)	0.041	[-0.001 0.007]	0.003 (0.002)	0.038	[-0.001 0.007]
Gender (Female)	-0.019 (0.025)	-0.024	[-0.067 0.029]	-0.005 (0.025)	-0.006	[-0.053 0.044]	-0.012(0.025)	-0.014	[-0.060 0.037]
Years of residence	-0.001 (0.001)	-0.006	[-0.002 0.001]	0.000 (0.001)	-0.012	[-0.002 0.001]	0.000 (0.001)	-0.014	[-0.002 0.001]
Income	0.012 (0.029)	0.012	[-0.046 0.069]	0.006 (0.029)	0.006	[-0.052 0.063]	0.015 (0.029)	0.016	[-0.042 0.073]
Health	0.092*** (0.015)	0.188	[0.062 0.121]	0.097 (0.015)	0.200	[0.068 0.127]	0.089 (0.015)	0.182	[0.060 0.118]
Ethnic (Dutch)	0.016 (0.037)	0.012	[-0.056 0.089]	0.008 (0.037)	0.006	[-0.064 0.080]	0.020 (0.037)	0.015	[-0.053 0.092]
Education (Low)									
Medium	0.014 (0.031)	0.016	[-0.046 0.074]	0.015 (0.030)	0.017	[-0.045 0.074]	0.021 (0.030)	0.024	[-0.039 0.081]
High	0.021 (0.031)	0.025	[-0.039 0.081]	0.024 (0.030)	0.029	[-0.035 0.083]	0.028 (0.030)	0.033	[-0.032 0.087]
Living Arrangement (single)	0.055 (0.026)	0.062	[0.003 0.106]	0.042 (0.026)	0.047	[-0.010 0.093]	0.042 (0.026)	0.048	[-0.009 0.094]
Wellbeing T0	0.613*** (0.031)	0.625	[0.553 0.673]	0.566 (0.035)	0.578	[0.498 0.634]	0.585 (0.033)	0.597	[0.520 0.650]
Support Privision_T0	0.008* (0.003)	0.066	[0.001 0.014]						
Cohesion T0				0.009 (0.002)	0.118	[0.004 0.013]			
Belonging T0							0.010 (0.003)	0.097	[0.003 0.016]
Intercept	0.440 (0.200)		[-0.047 0.832]	0.374 (0.200)		[-0.017 0.765]	0.285 (0.205)		[-0.118 0.688]
R^2	0.550			0.556			0.554		
Adjusted R^2	0.541			0.548			0.545		

*Notes. B = unstandardized coefficients; SE = standard error; β = standardized coefficient.*** p<0.001, ** p<0.01, * p<0.05.*

Results of SEM analyses

The built model yielded good model fit indices (CFI = 0.995, RMSEA = 0.044, SRMR = 0.027). The chi-square test was statistically significant ($\chi^2 = 13.995$, $df = 6$, $p = 0.008$), which is common as its value tends to increase along with the sample size (Barrett, 2007).

Figure 2 illustrates the estimates for the main paths among key variables. The solid lines represent statistically significant paths among interested variables, and the dotted line represents an insignificant relationship. Numbers on each line showed the standardized coefficients of the path it represents. Results showed that all auto-regressive paths for all key variables were significant with large effect sizes ($p < 0.001$), suggesting that all key variables are strongly predicted by its own prior value at T0. Support provision at T0 did not predict either cohesion ($\beta = -0.015$, $p = 0.747$, 95% CI [-0.162, 0.106]) or belonging ($\beta = 0.004$, $p = 0.888$, 95% CI [-0.064, 0.072]) at T1. Instead, we found that cohesion at T0 predicted a higher level of support provision at T1 ($\beta = 0.100$, $p = 0.009$, 95% CI [0.017, 0.122]), yet belonging at T0 did not predict support provision at T1 ($\beta = 0.002$, $p = 0.962$, 95% CI [-0.059, 0.068]), indicating an effect separation between cohesion and belonging. These results indicate a lack of reciprocal relationships between social cohesion/belonging and support provision, rejecting the third hypothesis. Additionally, hypothesis 4a, 4b and 5b are rejected.

Based on these findings, we further investigated the mediation paths between social cohesion (as independent variable), support provision (as mediator) and well-being (as dependent variable). Results show no significant indirect effect of support provision in the relationships between social cohesion and well-being ($\beta = -.0001$, $p = 0.856$, 95% CI: [-0.001, 0.001]), rejecting hypothesis 5a.

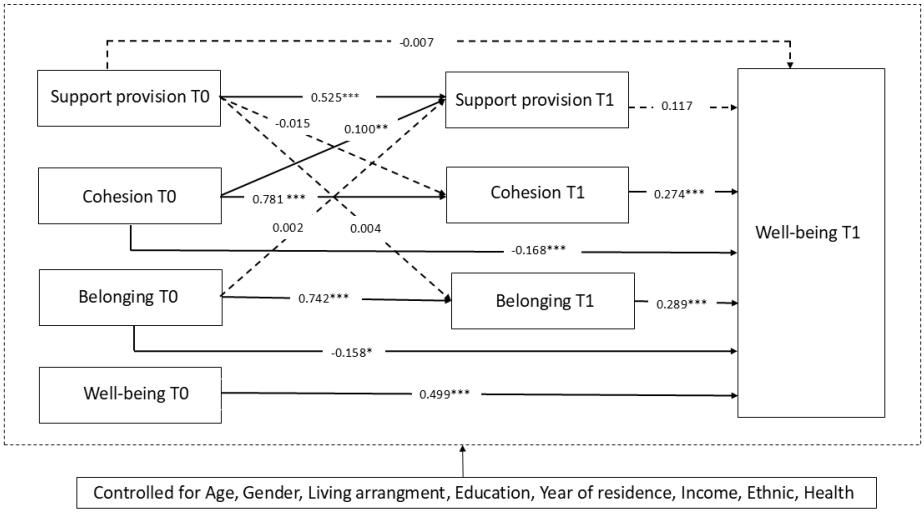

Figure 2. Path diagram of cross-lagged mediation model. (*** p<0.001, ** p<0.01, * p<0.05)

DISCUSSION

While the active aging agenda encourages older people to provide support to each other within the community, how the social community characteristics interact with the support behavior and thus influence their well-being is less known. We examined the relationships of support provision and social cohesion on well-being, the reciprocal relationship between support provision and social cohesion, and their mediating mechanisms in affecting well-being. We found no significant reciprocal relationships nor mediating effects. However, we found a unidirectional predictive role of cohesion on support provision. Furthermore, we found the influences of cohesion and belonging on older people's behavior of support provision are separated.

Our results found that older people who provide more support to the community have higher levels of well-being, confirming our first hypothesis. Despite the small effect size because of the inclusion of autoregressive paths, this finding is consistent with previous studies of the positive influence of providing support outside the family (Brown et al., 2003; Xia et al., 2024b). Providing support to those outside the family can improve older people's well-being because helping others enhances their feeling of being useful, which increases their self-esteem (Krause & Shaw, 2000; Xia et al., 2024b). Similarly, we found that social cohesion and belonging are both associated with an increase of well-being, confirming the second hypothesis. These findings were also consistent with previous findings that social cohesion and belonging can predict older people's well-being (Cramm & Nieboer, 2015; Kim et al., 2020). Social cohesion may lead to higher

levels of well-being among older people because it reflects their perceived community-level resources such as trust and friendliness, which provide a feeling of reassurance that they can rely on their neighbors (Forrest & Kearns, 2001).

Analyses investigating the reciprocal relationships between social cohesion and support provision showed no significant effects, declining our third hypothesis. Specifically, cohesion predicted support provision, but not vice versa. Older people who live in a cohesive community are more likely to engage in frequent helping activities, as it reflects strong social networks and good interpersonal relationships. However, our results showed that support provision does not explain cohesion. This might be attributed to the individual level measurement of social cohesion in our study. Some argue that social cohesion is a group level property, the measurement of individual perceptions may overlook the structural and collective dimensions (Fonseca et al., 2019). Participation in mutual helping behavior among individuals strengthens the community social network, thus enhances cohesion on a group level (Shen et al., 2017). However, the measurement of the individual's perception may not be able to capture the change of social cohesion on the community level. There could be a time lag between the social cohesion improvement on a community level to the individual level, a six months of measurement interval in our study might be too short to capture the change of community-level characteristic, and its transformation to individual's perception. Future studies measuring social cohesion at the community level or using research designs with a longer time lag could further investigate these relationships.

Importantly, we found separate effects of the sub-dimensions of social cohesion. Different from the predictive effect of cohesion on support provision, we did not find any relationship between belonging and support provision. While both cohesion and belonging are indicators of social cohesion, cohesion measures the reciprocal interactions within social networks. It implies one's perception of received support from the community, indicating the quality of one's interpersonal relationships within the community. In contrast, belonging measures the overall feeling of attachment to the community environment. It can be influenced by personal experiences and may not always be related to others in the community (Forrest & Kearns, 2001). Previous literature often has taken belonging as part of social cohesion (Jenson, 2010; Oberndorfer et al., 2022). The different effects of cohesion and belonging found in this study provide empirical evidence that cohesion and belonging are distinct components. Future studies are worth conducting to further investigate the conceptualization of social cohesion.

Furthermore, our findings contribute to the understanding of the definition of social cohesion and its practices for promoting community-based mutual support. Compared

to the definition of social cohesion that focuses on promoting shared values and belonging, our findings seem to support another definition, which states that "social cohesion does not require communities to merge into a homogeneous entity. On the contrary, cohesion can be achieved in a pluralist society through the interaction of different communities that build a bond through the recognition of difference and interdependence" (Manca, 2014). This definition emphasizes social interactions between community members, regardless of whether they are from the same community. Our findings, therefore, suggest that practices aimed at facilitating community-based mutual support can promote community building by fostering community bonds, rather than building a homogeneous community.

Mediation analyses did not find mediation paths between social cohesion, support provision and well-being, declining all hypotheses regarding mediations. The lack of mediating effects indicates the independent roles of support provision and social cohesion in benefiting older people, rather than a causal link. However, given that results were derived from longitudinal data with only a six-month interval, it is also possible that the mechanism from perceived cohesion to well-being through support provision exists, but over longer time internals.

Limitations

Several limitations need to be considered regarding this study. First, our individual-level measurement of social cohesion may not precisely capture the community-level characteristics of social cohesion. Multi-level approaches accounting social cohesion on both individual and community levels could be employed in future studies. Second, although we employed longitudinal study design, a six-month time interval might be too short to capture the dynamic change of social cohesion and well-being overtime. Future studies with longer time intervals could be conducted. Finally, since this study relied on self-reported data, reporting bias might exist. To capture the actual support interactions, other study designs that allow for direct observations, such as action research, are worth conducting to validate the findings from self-reported data.

Implications for policy and practice

Our findings shed light on policy and practice designs for facilitating aging in place. The active aging agenda advocates for optimizing the aging process by facilitating older people's active participation in their resided communities (WHO, 2002). Our findings suggest that, rather than encouraging older people to be active at the individual level, building a cohesive community environment with strong social networks is equally

important. Therefore, interventions and approaches at the community level are worth investing in, such as community-based initiatives, community facilities establishment, and even the development of technologies to promote neighborhood connections. These investments help to build a community environment that is both physically and socially supportive, enhancing older adults' well-being, fostering strong mutual support network, and ultimately enabling sustainable aging in place.

Conclusion

To our knowledge, this was the first study to examine the mediating mechanisms between support provision, social cohesion, and well-being among community-dwelling older people. Building on two-wave longitudinal data, our findings indicated that support provision, social cohesion and belonging are associated with a slight increase of well-being. In addition, there were no reciprocal relationships and mediating effects. Importantly, we found cohesion predicted an increase of support provision but not vice versa. No relationship between belonging and support provision was found, highlighting the unique impact of social cohesion on older people's behavior of providing support to the community. Identifying the mechanisms of how support behavior and social cohesion affect older people's well-being is important for understanding active aging. Further longitudinal investigations with longer time intervals are needed to provide stronger empirical evidence to fully understand the active aging process.

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CHAPTER 6

General Discussion

As the global population is aging and pressure on formal care is increasing, a sustainable health and social care system with a new balance between formal and informal care and support is needed. Programs and approaches stimulating community-based mutual support, where older people provide help to each other, are developing fast, while the mechanisms that facilitate older people's engagement and their influence on psychosocial health among community-dwelling older people remain unclear. This thesis aims to contribute to understanding the mechanisms of community-based mutual support and its influence on psychosocial health for community-dwelling older people.

In the following section of this chapter, the main findings of the studies conducted in this thesis will be outlined. Besides, a discussion on the main themes will be presented. Furthermore, methodological considerations will be introduced. Finally, recommendations for future research and implications for practice and policies will be described.

MAIN RESEARCH FINDINGS

Research question 1: How does community-based mutual support interact with family support to influence psychosocial health?

This thesis begins from the perspective of family support, examining the influence of social participation on older people's psychosocial health among Chinese older people, indicated by depressive symptoms. Social participation is important for older adults to maintain connections within their communities, which creates the opportunity to provide help to each other. However, older people's ability and opportunity to participate in social activities can be significantly affected by their socioeconomic status. Older adults with financial strains often lack time and energy for social engagement, as they need to focus on securing essentials. For those who receive insufficient financial support from pensions, financial support from adult children is the primary economic recourse they have, which can significantly affect their capacity for social participation, and consequently their psychosocial health. By using both cross-sectional and longitudinal data analysis, results in **Chapter 2** show that receiving financial support from children and social participation are both associated with less depressive symptoms among older people. Furthermore, social participation plays a partial mediating role in the short-term, and a full mediating role in the long-term, in the relationship between financial support and depressive symptoms. These findings suggest that financial support is important for older people's psychosocial health by not only decreasing depressive symptoms directly but also facilitating social participation. This mediation path underscores the

psychological value of social participation as the mechanism that amplifies the positive impacts of financial resources on older people's health, particularly in the long-term.

It should be noted that in the Chinese context, financial support from children may not only signify the financial aspect but also be considered part of the traditional culture of filial piety of taking good care of older parents. Therefore, it might not be the monetary elements that improve older people's mental health but the enjoyment of intergenerational relationships (Y. Wu et al., 2018). A higher level of financial support from adult children may reflect stronger personal filial bonds between older people with children, which explains the lower level of depressive symptoms. Given the high social and cultural context reliance of our findings, the role of family financial support might vary depending on the social context. Findings in China may not apply to older people from different sociocultural backgrounds. Cross-cultural comparison studies are worth investigating in the future.

Results in this chapter emphasize the beneficial role of social participation for older people. This is consistent with older people's need for continuity (Atchley, 1989), engaging in social activities enables older people to sustain their social roles and maintain connections within their social network, reducing the risk of long-term social isolation (Santini, Jose, York Cornwell, et al., 2020). The transition from a partial mediating effect in the short-term to a full mediating effect in the long-term of social participation indicates that it is the influence of social participation, rather than financial security, that benefits older people from depressive symptoms. Generally, both the short-term and long-term findings in this chapter suggest that social participation is significantly beneficial of the psychological well-being for older people, that is also the case for those who financially rely on family support.

Research Question 2: How does reciprocity in community-based mutual support behavior influence psychosocial health among community-dwelling older people?

After exploring the mechanisms facilitating older people's engagement in community-based mutual support, we investigated the psychosocial outcomes of mutual support, from the perspective of the balance between giving and receiving support with nonrelatives. In **Chapter 3**, we examined the influence of support balance with nonrelatives on subjective well-being among community-dwelling older people.

We found that compared to imbalanced receiving (receiving more support than giving), both imbalanced giving (giving more support than receiving) and balanced support are associated with a higher level of subjective well-being among community-dwelling older

people, as indicated by a higher level of quality of life and life satisfaction, and a lower level of depression. The results in this Chapter align with the esteem-enhancement theory, which suggests that individuals have the need to maintain a positive sense of self-worth, as this contributes to overall well-being (DuBois et al., 2009). Providing help to others might be beneficial even if there is no balanced support because the behavior of caring for others enhances the feeling of being useful, which increases one's self-esteem. This may also explain the negative effect of receiving imbalanced support from people outside the family, that over-receiving from others implies incapacity in daily life, which may damage self-esteem, and further lead to worse psychosocial health (Bracke et al., 2008).

The beneficial effect of providing support to others is particularly significant for older people who often gradually withdraw from social roles because of retirement and declining physical health. Providing support to others outside of the family enhances social interaction, and strengthens connections with the community, which are crucial for preventing isolation and thus for maintaining psychosocial health. The findings in this chapter are consistent with results in previous studies that individuals who participate in socially productive activities experience better well-being compared to those who do not engage in such activities (Munn et al., 2009).

Meanwhile, results in this chapter support the idea of active aging approaches advocated across countries. Providing support to those outside the family not only enhances older people's subjective well-being but also aligns with the broader goal of promoting healthy and successful aging. Encouraging older people to engage in mutual support in the community may strengthen their psychosocial health on an individual level while fostering an inclusive and participatory society. These findings highlight the potential of community-based mutual support to enable better aging in place for older people.

Research Question 3: What are the mechanisms that facilitate community-dwelling older people to participate in community-based mutual support through relevant community-based initiatives?

By investigating perceptions of different stakeholders in five Dutch citizens' initiatives, results in **Chapter 4** reveal that older people can be facilitated to engage with community-based mutual support through a dynamic interplay of factors at the individual level, community and initiative levels.

At the individual level, older people can be facilitated to engage with mutual support when they have and are aware of relevant abilities, are motivated, and experience the opportunity to participate. This aligns with the ability-motivation-opportunity

(AMO) model that one can perform most effectively when perceiving capabilities, being motivated both intrinsically and extrinsically, and having opportunities to engage with performance (Marin-Garcia & Tomas, 2016). At the community level, a socially supportive environment characterized by trust, a sense of belonging, safety and shared values is important, as it enhances older people's connection with the community, strengthens their relationships with others, thus motivating individuals to participate. This is consistent with the social capital theory, which suggests that strong social cohesion with trust, social norms and a sense of belonging serves as an important form of community capital that creates possibilities for collaborative efforts (Putnam, 2000). Furthermore, community-based initiatives help to build a supportive physical environment to facilitate older people's engagement by stimulating individuals directly and through enhancing the social environment indirectly. The interactions between factors on different levels create a dynamic cycle that facilitates the participation of mutual support among older people. Findings on the multi-level mechanisms reflect the social ecological model of health behavior, which underscores the interaction of individual behavior and surrounding environment (Golden & Earp, 2012). Participation in mutual support enhances social connections and feelings of belonging, trust and safety, which in turn boosts individuals' motivation to continue contributing. Similarly, perceived cohesion with strong trust and shared values within the neighborhood not only encourages individuals' participation but also enhances the social capital for the initiatives to develop and thrive.

The results of this chapter emphasize the importance of multi-level approaches that consider factors on multiple levels and their interplays to facilitate older people's engagement in mutual support. Building an environment that is both physically and socially supportive is essential in empowering community-dwelling older people to engage with the community and provide help to each other. This chapter contributes to providing a comprehensive perspective on fostering a sustainable mutual support system for community-dwelling older people.

Research Question 4: How does the community environment interact with mutual support and ultimately influence psychosocial health among community-dwelling older people?

Based on findings from qualitative research, we further conducted a survey study to examine how neighborhood social cohesion interacts with older people's engagement in community-based mutual support and the influence on well-being. The results in **Chapter 5** show that providing informal support, and both the sub-dimensions of social cohesion, cohesion and belonging, are associated with an increase in older people's

well-being. Further cross-lagged analyses examining the relationship between support provision and social cohesion show that neighborhood cohesion was significantly associated with an increase in support provision, while belonging does not predict changes in support provision. Neighborhood cohesion measures reciprocal interactions within social networks, indicating the quality of one's interpersonal relationships within the community (Fonseca et al., 2019). In contrast, belonging measures the overall feeling of attachment to the community, which can be influenced by personal experiences and may not always be related to others in the community (Fonseca et al., 2019). Our results regarding the distinct effects of cohesion and belonging suggest that they are independent community characteristics that should be conceptualized differently.

In addition, we did not find a reciprocal relationship between social cohesion and support provision. Specifically, cohesion predicted support provision, but not vice versa. Social cohesion, as a dimension of the social environment, has the potential to facilitate older people's engagement in support provision, as it reflects one's perceived community-level resources such as trust and friendliness that are beneficial for interpersonal relationships (Davies et al., 2024; Johnson et al., 2018). However, we did not observe the predictive effect of support provision on cohesion. This finding might be attributed to the individual-level measurement approach employed in this study. We measured older people's perception of social cohesion at the individual level. However, providing cohesion support may contribute to the broader enhancement of social networks on a group level, rather than directly enhancing one's perception of social cohesion on the individual level (Oberndorfer et al., 2022). Furthermore, a six-month period of interval might be insufficient to capture the perception change on the individual level. Future studies measuring social cohesion at the community level or using study designs with a longer time lag could be conducted to further investigate these relationships.

We also examined the mediation mechanisms between support provision, neighborhood cohesion, belonging, and well-being. Results show no mediation effect, indicating the independent roles of support provision and social cohesion in benefiting older people, rather than a causal link between. However, given that results were derived from longitudinal data with only a six-month interval, it is also possible that the mechanism from perceived cohesion to well-being through support provision exists, but the time internal in our data was too short to capture a significant relationship.

The results in this chapter shed light on the mechanisms through which community characteristics interact with older people's participation in informal support behavior to ultimately affect their psychosocial health. The findings confirm the facilitating role of community cohesion in older people's support provision, highlighting the importance

of building a cohesive environment to promote older people's active participation in their communities.

DISCUSSION

The studies in this thesis provide insights into the mechanisms and psychosocial outcomes associated with community-based mutual support. Specifically, the results reveal the facilitating mechanisms involving interactions among multi-level factors. Additionally, we investigated various psychosocial outcomes of mutual support, such as depression and well-being. From these empirical findings, we identify three overarching themes for further elaboration, which will be presented in the following paragraphs, namely the active aging perspective of community-based mutual support, the role of social cohesion for mutual support, and contextualizing community-based mutual support in care systems.

The active aging perspective of community-based mutual support

The concept of active aging, first introduced at the beginning of the 21st century, has been recognized as one of the key policy frameworks for aging, taking health, participation, and security as three pillars for enhancing the quality of life as people age (Paúl et al., 2012). This framework provides a valuable perspective for understanding the mechanisms and psychosocial impact of community-based mutual support. Meanwhile, this thesis contributes to enriching the understanding of active aging.

Although the active aging paradigm has been seen as the "ideal framework for public policy planning and for responding to the population aging" (López-López & Sánchez, 2020), the underlying reasoning should be carefully taken into consideration. A fundamental aspect of the active aging framework is to enhance older people's participation and independence. Participating in mutual support, such as helping neighbors or attending productive group activities, aligns with the notion of the active aging framework by keeping older people physically, mentally, and socially engaged. One paradigm widely adopted in Europe is driven by the neoliberal and productivist perspective, which emphasizes individual responsibility and autonomy (Foster & Walker, 2021). This paradigm reflects primarily on economic reasoning, where individuals seek optimal value for themselves as long as it reduces dependency on public resources. As a result, practices and policies are usually economically driven and focus primarily on paid employment and postponing retirement. This approach, however, as criticized by Pfaller and Schweda (2019), "actually functions as a mere alibi for dismantling the welfare state and shifting risks and costs to the single individual." Consequently, retirement

can be transformed from a positive expectation of one's opportunity to thrive in later life into a negative perception associated with lack of employment, thereby leading to inequalities and age discrimination (Foster & Walker, 2021). In contrast, findings in this thesis reveal a psychosocial reasoning behind the active aging paradigm, where the economic optimization of older people is not the priority. In contrast, it emphasizes that individuals have the capacity and opportunity to thrive and maintain their quality of life at different stages across the lifespan by staying active and engaging with the community. Our findings of **Chapter 3** show that the higher level of well-being for providing balanced support of giving and receiving, as well as for more support than more receiving with people outside the family, highlight the value of staying active and being able to help the community. Participating in reciprocal helping behavior with others indicates capability and independence, and enhances one's self-esteem (DuBois et al., 2009), thereby improving psychosocial well-being.

In addition, while active aging emphasizes the value of independence and autonomy, this thesis highlights the value of interpersonal relationships within the community for promoting active aging, suggesting that independence thrives through the enhancement of interdependence. Sánchez (2012) has criticized that the individualistic and productivity-centered concept of active aging implemented in many European regions has endangered intergenerational solidarity. This thesis contributes to the active aging discourse by emphasizing the importance of balancing independence and interdependence within the community. Furthermore, our findings among Chinese older people reflect a relational form of active aging, demonstrated by the interaction between social participation and intergenerational relationships within the family. However, since the influence of intergenerational relationships was only investigated among Chinese older people, whether these findings also apply to European older people remains unclear. Future studies focusing on this topic are worth conducting.

A supportive environment is important for older people to remain active, as it provides opportunities for them to build connections and engage with community resources, thereby enhancing their feeling of security within the community. While physical and social environments are important for active aging, previous research has usually focused on single aspects of the environment of physical in facilitating active aging (Moran et al., 2014; Sánchez-González et al., 2020). There remains a lack of unified definitions and standards for assessing them, as well as a clear understanding of the mechanism through which they promote active aging (Hijas-Gómez et al., 2020). The study presented in **Chapter 4** identifies several key community resources that can facilitate older people's participation in community-based mutual support. Importantly, we identify the mechanisms through which community resources interact with the individuals and

ultimately facilitate their participation in supportive activities. By focusing on physical environmental resources that directly and indirectly relate to older people's supporting behaviors, this thesis provides a nuanced understanding of how the built environment interacts with behavioral processes. As a result, this thesis contributes to a more refined framework of active aging, especially in the context of community-based mutual support. In the next section, a discussion on the social environment will be presented.

The role of social cohesion for mutual support

While physical community resources help to build a supportive environment in facilitating mutual support, this thesis makes extra contributions by revealing the importance of the social aspect of the community environment. The studies reported in this thesis found that mutual support is facilitated not only directly by community facilities but also indirectly through enhanced social cohesion resulting from community building. For older people who spend most of their time in their residual neighborhood, a cohesive community provides both physical and social opportunities for active engagement (Cradock et al., 2009; Johnson et al., 2018). Older people living in a cohesive community are more likely to build strong social bonds, which increase the possibility of helping each other (W. K. S. Leung et al., 2022). Furthermore, our findings suggest that helping interactions in the community increases older people's self-esteem, which, in turn, benefits their psychosocial well-being (DuBois et al., 2009). This thesis highlights the importance of community building as a positive and comprehensive process that encompasses not only infrastructure development but also the fostering of social cohesion.

Fostering social cohesion through community building seems also to be important for the development of related programs that aim to facilitate mutual support. The "*Timebanking*" model, for example, was originally conceptualized using an economic framework that mimicked market-like conditions, where individuals exchange services based on time as a unit of currency, with an intention to build a non-monetary system of interpersonal reciprocity (Valek & Bures, 2018). In practice, however, the implementation of "*Timebanking*" programs has evolved beyond the transactional logic and has become deeply embedded in community networks (S. Lu et al., 2024; Manta & Palazzo, 2024; Naughton-Doe et al., 2021; Y. Wu et al., 2021). Although the programs facilitate service exchange on a person-in-person basis, the ultimate aim is to build a co-production approach where social care is delivered by a strong community network constructed by community members (Naughton-Doe et al., 2021). Therefore, rather than simply being an alternative currency system, cultivating a cohesive community with strong community networks appears to be a necessary environmental basis for fostering support exchange. Our findings reported in **Chapter 5** support this mechanism, by demonstrating the

predictive role of social cohesion in facilitating provision of support to the community. This thesis contributes to understanding the mechanisms to facilitate mutual support, reinforces the importance of building a cohesive community environments in the design of such programs.

Building a cohesive environment for mutual support is crucial not only for older people's well-being but also for building a sustainable health and social care system. While current research and policy frameworks recognize the need for community-based integrated care systems, older people are still primarily positioned as recipients of care and support rather than active contributors to their communities. In a cohesive community, older people's active participation in informal support builds a strong informal support network in the community. Furthermore, individuals living in cohesive communities are more likely to trust and use formal care services, for example using preventive healthcare resources (Kim & Kawachi, 2017). This allows professional care providers and community organizations to collaborate effectively, as they are able to make use of the existing neighborhood network and improve responsiveness to older people's social and physical needs. The effective use of informal support resources can reduce the reliance on formal care services. Additionally, by encouraging neighborhood support, older people are enabled to participate in the co-production of care service design, helping to build health and social care systems that really meet their needs. By focusing on community-based mutual support, this thesis highlights the importance of recognizing older people as valuable community assets, emphasizes their potential of not only benefiting their own well-being but also strengthening community capital to build a resilient and sustainable care system. Our results contribute to understanding how to build an equal and efficient care system by enhancing interactions at the community level.

While findings in this thesis underscore the benefits of social cohesion in facilitating mutual support through a supportive social environment, it is also important to acknowledge the potential risks when fostering social cohesion. Overly strong social ties can create pressure and social obligations or even lead to social exclusion (Villalonga-Olives & Kawachi, 2017). In this case, a high level of social cohesion may result in resistance to external interventions, making the integration of formal services more difficult. Moreover, community members may feel compelled to provide help and care even when they are unable or unwilling to do so, leading to stress and overburden (Andersen et al., 2022). The study in **Chapter 4** highlights the importance of preventing excessive volunteering, as it can lead to overburdening and damage sustainable participation in mutual support. Therefore, balancing the benefits of strong social cohesion and its risks is also necessary. In general, our findings in this thesis extend the

understanding the community-based mutual support, highlight the value of building a supportive community environment with strong social cohesion.

Contextualizing community-based mutual support in care systems

While community-based mutual support is considered beneficial to facilitate a sustainable health and social care system, the way it integrates into care systems varies across social contexts. Therefore, adapting community-based mutual support by appropriately positioning it in the care systems across social contexts is essential. Meanwhile, access to community-based mutual support should also be considered, as it is essential for the development of sustainable care systems that are accessible to everyone.

Positioning community-based mutual support in care systems

In the Netherlands, the healthcare system is shifting from a generous welfare state, where the government takes the major responsibility for providing care to those in need, towards a more informal, decentralized, community-based model (Berkers et al., 2021; Dijkhoff, 2014). The shift towards decentralized care responsibilities has been explicitly stated in the Social Support Act (WMO). However, in the national policy framework, mutual support is not explicitly positioned within the care system. Instead, it is embedded in a broader discourse of active citizenship or civic engagement. This thesis makes unique contributions by explicitly extracting the concept of mutual support from the broader discourse of care and support. Additionally, while the transition in the Netherlands is driven by a combination of economic considerations and a societal move toward citizen autonomy and reduced dependence on government provision (De Jong et al., 2019; Maarse & Jeurissen, 2016), our study findings reveal the value of interdependence within the community during the aging process.

In contrast to the Netherlands, China is undergoing a transition from a more traditionally family-based care system to a hybrid care system that integrates community care alongside family care (Q. Xu & Chow, 2011). Mutual support is seen as part of the home and community-based services (HCBS) and as a way to bridge the gap between declining family care and underdeveloped institutional care (Ge, Ailing; Feng, 2018). Mutual support is explicitly mentioned in national policy documents, implying strong government support. However, these policies only provide rough guidelines, while the specific position and role of community-based mutual support in the health and social care systems are still under debate. So far, two predominant perspectives exist among researchers (Meng & Peng, 2024). The first views community-based mutual support as a "third way" between family care and institutional care, claiming its position as an independent care approach (Meng & Peng, 2024). The second argues that community-

based mutual support is not independent of family and institutional care but rather serves as a supplementary model that integrates family, community, and institutional care systems (Meng & Peng, 2024). Our findings align with the latter perspective, suggesting that mutual support should not be framed as a standalone paradigm replacing the existing care system, but rather as a complementary approach. This thesis supports its position as part of the community-based approach, that should be integrated with family and professional care to improve the effectiveness of the current health and social care system.

Successfully promoting community-based mutual support, however, requires careful consideration to several balancing aspects. First, a balance between individualistic and collective values needs to be considered. In the Netherlands, older people's participation is often linked with individualistic social norms, such as independence and autonomy (H. L. Chen, 2007). In China, in contrast, the promotion of mutual support is rooted in collectivist values, emphasizing social connections and interdependence with families and communities. Interestingly, the study in **Chapter 4** found that from the Dutch initiatives' perspective, collectivistic values are important to facilitate mutual support, as phrases such as "solidarity" and "group power" are frequently emphasized in the interviews. Second, a balance between bottom-up governance and top-down management is required. Results of this thesis show that, on the one hand, community building requires stable institutional support in terms of financial and facility resources. On the other hand, the effective implementation of community-based mutual support requires flexible bottom-up management. These findings reveal that a hybrid approach is crucial for the sustainable development of community-based mutual support. Support from the state provides legitimacy and stability, and operational flexibility at the community level ensures active participation, yet a good balance between their responsibility should be clear to ensure sustainable development. Third, balancing formal and informal care is essential. The study in **Chapter 4** found that a lack of clear responsibility boundaries can lead to over-reliance on and overburden for informal support givers, which damages their sustainable participation. Integrating informal support networks with formal care services improves accessibility to support resources, but this integration is only sustainable when the boundaries and interactions between professional formal care and informal support are clarified. By highlighting the need to balance individualistic and collective values, top-down governance and bottom-up management, and the boundaries between formal and informal care, this thesis contributes to understanding how community-based mutual support can be sustainably integrated into health and social care systems, ensuring both long-term viability and inclusivity.

Access to community-based mutual support

While this thesis emphasizes the benefits of integrating community-based mutual support into the integrated care system, it is important to acknowledge the potential access barriers and the potential risks of its implementation. Overcoming these barriers is essential for designing inclusive interventions that enhance the participation for everyone and reduce inequalities. We consider access regarding socioeconomic barriers, group effect barriers, technological barriers, and institutional support barriers.

One of the most significant barriers affecting access is socioeconomic status. Older people with financial strains may not be able to participate in mutual support, as they need to continue working after retirement. Our findings in **Chapter 2** reveal the facilitating role of financial resources in social participation. Ensure basic financial security in later life is important to enable equal opportunity for participation. Additionally, Socioeconomic status can affect participation through community resources indirectly. Older people with higher socioeconomic status are more likely to live in communities with better transportation, well-funded community facilities, and less neighborhood disorders, which allows more opportunities to engage in mutual support (Latham & Clarke, 2018; Méndez et al., 2021). In contrast, economically disadvantaged older people are more likely to experience limited infrastructural resources and organizational support within their communities. The insufficient physical and organizational community resources hinder their opportunities to participate in mutual support, despite the strong community cohesion within groups. To address the resource disparities, it is essential to extend beyond promoting individual engagement to prioritize structural investment in under-resourced communities, as it is critical to ensuring equitable access to community-based support systems for older people from the broad range of communities.

While social cohesion can facilitate mutual support, the potential risk of group exclusion should be noticed, where those outside specific cohesive groups are hindered from access to community-based mutual support than group members. Research on *in-group favoritism* found that cohesive groups tend to cooperate within the group while developing biases against out-groups, leading to exclusionary practices (Balliet et al., 2014). Tightly connected social networks may restrict knowledge and resource sharing within certain groups, making it difficult for individuals from different backgrounds, such as minority groups and socially marginalized groups, to participate in mutual support networks. Additionally, interactions between community-level cohesion and individual characteristics should be noticed. Social capital does not uniformly benefit all individuals who live in the same community, individuals that tend to trust others could report even worse health if they resided in a low-trust community (Villalonga-Olives & Kawachi, 2017). It is essential to balance between strong community cohesion and the

potential risk of social exclusion, which is vital for fostering sustainable and equitable support systems.

Technological barriers can affect older people's engagement in mutual support significantly. As technologies developed fast in recent years, digital platforms are becoming increasingly crucial for the coordination and communication of various information and services. However, there are risks that those who lack digital skills or access to technologies are excluded from these affairs. This risk is particularly significant for older people, given that they tend to use digital technologies less than younger people (Mubarak & Suomi, 2022). This may hinder their participation in mutual support and even lead to social exclusion (Seifert et al., 2018). The study in **Chapter 4** shows that information-sharing platforms are essential for older people's engagement with community-based mutual support, as these platforms provide opportunities for them to be updated on community affairs, including information of support demands and supplies. Our findings indicate that, more inclusive and accessible platforms are needed to ensure that digitalization does not widen inequalities for community-based mutual support.

Finally, institutional support barriers should be considered, as it is essential for community-based support to be integrated into the health and social care systems. Although community-based mutual support has the potential to complement the formal health and social care systems, reducing the cost of healthcare and alleviating the pressure of professional care, it does not imply a complete substitution for public sectors. There is a concern that calls to promote informal support by older people themselves might shift the responsibility for care provision from the public sectors to communities and individuals with insufficient resources, thereby perpetuating injustices (Martinson & Minkler, 2006). Instead, this thesis claims that community-based mutual support should be recognized as a legitimate component of health and social care systems. It requires strong support from the public sectors, including but not limited to funding, infrastructure, and training support to communities, as they are essential for building an inclusive system, in which health and social care services are equally accessible to all.

METHODOLOGICAL CONSIDERATIONS

The results in this thesis should be viewed in light of several methodological considerations. In the following section, we reflect on the conceptualization of community-based mutual support and social cohesion and then discuss the strengths and limitations of the studies conducted in this thesis.

Conceptualization considerations

Conceptualization of community-based mutual support

Despite the growing emphasis on stimulating mutual support among community-dwelling older people, there remains no widely accepted definition of *community-based mutual support*, highlighting the conceptual ambiguity surrounding this phenomenon. The concept of community-based mutual support shares common ground with several established terms in previous literature, such as "mutual aid", "mutual assistance", "peer support", and "mutual support groups" (Abdikerimova & Feng, 2022; Becker et al., 2003; Fernandes-Jesus et al., 2021; Gottlieb, 2000; Jordan et al., 2021; Montesi, 2020; Murayama et al., 2021). While these established concepts contribute to understanding the support reciprocity among individuals, most of them take mutual support as a concept independent of the community environment. In some other literature, community-based mutual support itself was not the central focus, but a sub-concept embedded in organization-oriented research topics. For instance, under the WHO's Age-Friendly Cities framework, there is a huge number of studies focusing on community-based initiatives that are built to facilitate "aging in place", such as the "Naturally Occurring Retirement Community (NORC)", "Village" and "Co-housing" models (Glass, 2009; Greenfield et al., 2013; Hou & Cao, 2021). Although an important aim of these initiatives is creating channels through which older people can interact with each other, most studies on these initiatives focus on either structural aspect (e.g., housing design, program accessibility) or broader goals like promoting active aging and social participation. Few studies have focused explicitly on mutual support as the primary topic.

Community-based mutual support, as explored in this thesis, is a broader concept and encompasses both informal and formal support behaviors. It includes naturally occurring, day-to-day support between individuals, as well as organized support that is facilitated by formal organizations. Such support emphasizes reciprocal interactions in the community and among residents, either through informal social networks or structured programs. Given that we focus on community-dwelling older people, community-based mutual support can be understood as *the reciprocal exchange of resources,* care, and emotional connectedness among older people living in the same community, which can occur either naturally in the informal network or formally facilitated by community organizations. In this thesis, we explored community-based mutual support from the perspective of support behaviors, examining how older people give and receive support within their community networks, identifying the mechanisms that facilitate these exchanges. Furthermore, we investigated the psychosocial influences these behaviors bring to older people. By using the broad definition of community-based mutual support, we bridge the gap between established mutual support concepts (e.g.,

mutual aid, self-help) and the organizational contexts that promote reciprocity, offering a more comprehensive understanding of mutual support as it relates to older people's well-being.

Conceptualization of social cohesion

Social cohesion is a complex construct that has long been the subject of debate. Given various interests and perspectives among researchers from different study fields, there is a broad diversity of definitions and constructions of social cohesion (Fonseca et al., 2019). Cheong (2007) suggested that, despite the diversity of the lineages of social cohesion, it is "a moveable feast, aligned with the political and ideological positions of policymakers, practitioners, and academics". According to Chan (2006), there are two distinctive approaches used in the literature. The first approach includes sociological and psychosocial perspectives, focusing on concepts such as social integration and stability, often without explicitly defining social cohesion. Another approach is economic and social dimensions. These two are found both insufficient, given that they either mix the definition with its antecedents or have no precise definition. In this thesis, we refer mostly to Putnam's perspective of social capital, taking social cohesion as a community capital that can be perceived by residents, focusing on groups and communities' extent and practices of civic engagement and the operation of social norms (Kawachi & Berkman, 2000). This also applies to the conceptualization of social cohesion by Bernard and Chan's perspective, which refers to:

"A state of affairs that concerning of both the vertical and the horizontal interactions among members of a society, as characterized by a set of attitudes and norms that include trust, a sense of belonging, and the willingness to participate and help, as well as their behavioral manifestations." (Chan et al., 2006).

Yet, in this thesis, we separated the behavior of providing support to others, which has been considered an element of social cohesion in most previous literature, from the conceptualization of social cohesion. Individuals' perception of social cohesion refers to the social capital one has perceived, while providing support to others is the consequence/antecedent of social cohesion, rather than the content of the definition itself.

Research on social cohesion mainly provides perspective on three levels: individual, community, and institutions (Fonseca et al., 2019). In this thesis, we focus on social cohesion at the individual and community level such as a sense of belonging, trust and shared values. Elements at the institutional level, such as lack of social conflict, crime, social exclusion and inequality are not discussed in this thesis. However, this perspective is also important for building a community that is friendly to mutual support. Future

studies designed to research social cohesion should be consider the perspective of institutions.

Strengths

In this thesis, we employed a mixed-methods design, integrating both qualitative and quantitative approaches, including large-scale database studies, a survey study, and a multiple case study. This multi-method approach allows for a comprehensive examination of community-based mutual support from various perspectives, providing information that is both statistically robust and contextually rich. First, we used data from two large-scale datasets to investigate the associations between community-based mutual support and older people's psychosocial health. By providing population-level evidence from older people across different social contexts, this thesis contributes to a broader understanding of the psychosocial outcomes that community-based mutual support can generate. Compared to small-sample studies, the use of large-scale, longitudinal data enhances statistical power and strengthens the generalizability of the findings. Next, we used a qualitative case study to explore the mechanisms that facilitate older people's participation in community-based mutual support. By investigating the experiences and opinions of various stakeholders in community-based initiatives through interviews, the qualitative study adds in-depth and contextualized perspectives, uncovering the underlying mechanisms that facilitate community-based mutual support. This qualitative design enables us to identify a series of variables covering multiple levels for further examination. Building on the findings from the large-scale database study and deeper insights from the qualitative study, we build a hypothesized model and conducted a survey study to examine the relationships between the facilitating mechanisms of community-based mutual support and its effects on older people's psychosocial health. This approach of integrating quantitative analyses (including longitudinal or cross-sectional data) with qualitative interviews provides a holistic understanding of mutual support. This mixed-method design reduces the risk of over-reliance on a single methodological perspective, providing triangulated evidence that is both empirically robust and contextually grounded (Doyle et al., 2009).

Additionally, this thesis makes a unique methodological contribution by creatively conceptualizing mutual support behavior as the balancing act of receiving and giving support. Using data collected from multiple time points, we were able to calculate the cross-time concept of support balance. This strategy may reflect individual's subjective perception of reciprocity more precisely, as the concept of "support bank" suggests that individuals maintain a mental record of the support they have received and given (Antonucci & Jackson, 1989). This division of support receiving and giving allows for a nuanced

perspective on mutual support behavior by emphasizing the elements of reciprocity, advancing the literature on support exchange and its impact on psychosocial health.

Moreover, we adopted a multi-dimensional perspective in measuring social cohesion, recognizing that social cohesion is not a single-dimensional construct but rather consists of various subdimensions. By operationally distinguishing the measurement of belonging from other elements of social cohesion, this thesis contributes to a more refined understanding of how different aspects of social cohesion interact with mutual support behaviors and thus influence older people's psychosocial health.

Limitations

Despite the strengths mentioned above, several limitations in this thesis need to be taken into account.

First, although this thesis provides some longitudinal evidence regarding the psychosocial influence of mutual support behavior and the in-depth investigation of the mechanisms facilitating community-based mutual support, it is insufficient to provide strong causal evidence for the implementation of community-based mutual support, specifically, the effect of community-based initiatives in facilitating mutual support. The absence of intervention-based or experimental study designs (e.g. randomized controlled trials for the community-based mutual support project) limits the ability to assess the effectiveness of community-based mutual support initiatives over time. Therefore, while the benefits of support-giving behaviors are confirmed, the specific value of mutual support interventions (e.g. initiatives) remains unclear. Additionally, the findings on mechanisms are based on data from interviews, which only provide indirect evidence and do not capture actual mutual support interactions in practice.

Second, the generalizability of our findings is constrained. While studies in this thesis were conducted with community-dwelling older people from diverse ethnic, cultural, and socioeconomic backgrounds, the findings for each group cannot be directly extended to other groups of people. Although aging in place is a common aspiration of older people across countries, individuals may have different values and preferences according the socioeconomic and cultural backgrounds (Kendig et al., 2017; Lum et al., 2016; Wiles et al., 2012; Zhong et al., 2024). Furthermore, the qualitative study in this thesis was conducted within specific communities in the Netherlands. The nature of qualitative research determines that the results are highly context-dependent and may not be transferable to other settings (L. Leung, 2015). There is also a lack of comparison of mutual support initiatives in varying socioeconomic and cultural contexts. Consequently, it is unclear

whether these qualitative findings can be generalized to other settings with different socioeconomic environments. Although we intended to compare these findings with those from different contexts, such as China, we encountered difficulties in collecting high-quality data in China for comparison research. Therefore, we ultimately could only use data from initiatives in the Netherlands to shape the empirical findings for this thesis.

Finally, measurement biases of several key variables in our quantitative studies must be considered. The measurement of the support behavior was heterogeneous, ranging from specific helping tasks to participation in social activities, reflecting the multifaceted nature of mutual support. However, considering that mutual support might take different forms of behavior depending on cultural contexts (e.g. some communities emphasize formal volunteering, while others prefer participating in group activities), this context-specific measurement accounts for the cultural background of different groups of people, which may reduce measurement bias. Additionally, the psychosocial health outcomes were assessed with various indicators, including depression, quality of life, life satisfaction, and well-being. While the instruments used in this thesis capture key dimensions of psychosocial well-being with good validity and reliability, some other indicators such as loneliness might also be relevant. Moreover, only certain elements of social cohesion were assessed. Given the complexity of the concept of social cohesion, the chosen scales may not fully capture the broader community dynamics influencing mutual support. Lastly, all indicators were assessed using self-reported measurements. Reliance on self-reported measures often raises a risk of social desirability bias or recall bias. Older people may overstate positive engagement or underreport negative experiences (Donaldson & Grant-Vallone, 2002). We do not know to what extent these biases might have influenced the results.

RECOMMENDATIONS FOR FUTURE RESEARCH AND IMPLICATIONS FOR PRACTICE AND POLICY

Recommendations for future research

While this thesis provides insights into the antecedents and benefits of community-based mutual support, questions remain for future investigations. We provide recommendations for future research from the theme-based and methodology-based perspectives.

Theme-based recommendation

From the theme-based perspective, different research focuses should be considered in future studies. First, although the findings in this thesis suggest that participation in

mutual support is positively associated with psychosocial health, it remains unclear how these impacts evolve over time. Understanding these dynamics will provide stronger empirical evidence for designing sustainable practices that can facilitate mutual support throughout later life. Future research using longitudinal approaches is needed to investigate the changing dynamics of mutual support behavior and its psychosocial impact over time.

Second, it is still unclear how socioeconomic and political-cultural backgrounds affect older people's participation in community-based mutual support, as motivations, preferences, and barriers to participation can vary depending on the context in which individuals live (Srivarathan et al., 2019). Older people from disadvantaged socioeconomic backgrounds, minority groups, or immigrant populations may face additional barriers in accessing mutual support networks, despite their heightened need for such resources. Additionally, while this thesis highlights the role of social cohesion in shaping support networks, its facilitating mechanisms can vary across contexts. For example, a study conducted in China found that older people in economically disadvantaged communities in Shanghai do not perceive lower levels of social cohesion, due to the unique socioeconomic and political-cultural development history of China (Miao et al., 2019). Furthermore, older people's preferences regarding the type of mutual support they engage in can vary across contexts. Individuals from collectivist societies are more likely to provide support through group activities, whereas older people living in individualistic societies usually prefer one-on-one formal volunteering (Finkelstein, 2011). These findings highlight the importance of contextual factors in shaping community-based mutual support and older people's participation. Future studies should focus on how socioeconomic and political-cultural factors affect older people's engagement in mutual support. For example, cross-context studies can provide evidence on how context-specific factors shape community-based mutual support and older people's participation in such programs. This will contribute to the development of community-based approaches that are inclusive of individuals with diverse backgrounds and better meet the needs of specific target groups.

Third, further investigation is needed into how community-based mutual support can be integrated within formal health and social care systems. While this thesis highlights the complementary role of mutual support, the precise mechanisms for integrating it into the health and care systems remain unclear. Future research can be conducted from the macro level to investigate how mutual support can be embedded into the community-based care systems and further in the broader health and care systems. Additionally, further research is needed to understand how mutual support networks interact with professional healthcare providers at the community level. Although this

thesis emphasizes the importance of collaboration within and across organizations, it does not provide further evidence on how to facilitate it. Empirical studies can contribute to developing an efficient and accessible integrated care system.

Methodology-based recommendation

To provide stronger empirical evidence, different methodologies should be considered to further clarify the questions above. First, given the limited evidence for causal inference in this thesis, we propose that future research should focus on intervention studies examining the effect of community-based interventions, which can provide stronger evidence for stakeholders to improve the development of community-based mutual support. Intervention-based study designs could be adopted in the future. For example, longitudinal quasi-experimental designs are valuable for relevant projects and programs to assess the long-term psychosocial impacts of mutual support behavior for older people. These research designs would be able to provide stronger causal evidence for the effects of mutual support interventions and help stakeholders to improve the development of community-based mutual support.

Second, future studies should incorporate direct observations of mutual support interactions. The findings of this thesis are based on indirect data from self-reported surveys or interviews with selected participants. However, these methods do not capture the actual mutual support interactions in real-world settings, which may introduce bias. Other study designs, such as ethnographic fieldwork and action research within community-based initiatives, can capture real-life mutual support interactions and validate self-reported experiences from surveys and interviews. For example, action research enables researchers, practitioners, and older people to collaboratively identify barriers and solutions, ensuring that findings are both practical and contextually relevant (Stringer & Aragón, 2020). Additionally, although this thesis contributes to the theoretical understanding of community-based mutual support, there is a missing link between theory and practice. Participatory approaches, where researchers work collaboratively with communities through co-creation processes, can provide more practical insights into the facilitating mechanisms and innovative solutions for the implementation of community-based mutual support. By embedding research within real-world practice, action research and participatory approaches help to bridge the gap between theory and application, allowing mutual support programs to evolve in response to community needs and lived experiences, thereby improving the effectiveness and sustainability of such initiatives.

Finally, future studies may consider using more comprehensive measurement instruments to deepen the understanding of community-based mutual support. For

example, given the complexity of social cohesion, future research should focus on refining multidimensional assessment tools to capture the various elements of social cohesion and their specific roles in relation to community-based mutual support. In addition, while this thesis primarily examines the well-being of older people as an outcome of community-based mutual support, broader outcomes are also important to be considered. For instance, the impact of community-based mutual support on fostering age-friendly community development, reducing healthcare costs, and alleviating formal services stress are worth investigating. By expanding the focus to include both individual and community-level outcomes, future studies will contribute to a more holistic understanding of community-based mutual support, providing empirical evidence for better practice in related fields.

Implications for practice

As governments increasingly establish policies aimed at enabling older people to stay in the community for as long as possible and promoting a participatory society, fostering community-based mutual support for older people will become increasingly important in the future. The findings of this thesis shed light on the mechanisms facilitating mutual support, confirming its positive contributions to older people's psychosocial well-being and its role in building age-friendly communities that support active aging and aging in place. This thesis reveals several implications for future practices.

Older people themselves and their network members are the core actors in mutual support. Our findings indicate the importance of recognizing older people as capable contributors to society, not from an economic perspective of individual's responsibility to care for themselves, but from an empowerment perspective that emphasizes older people's potential to live a quality life as they age. From the perspective of mutual support, this thesis clearly demonstrates the benefits of older people remaining active and engaging with their community network. Raising awareness about the benefits of mutual support among older people is crucial, as it benefits both themselves and the broader community environment. Meanwhile, it should be recognized that despite the current transitions toward informal support, over-reliance on community residents can lead to unstable and unqualified service delivery due to varying levels of commitment and availability of informal support-givers(P. Lu et al., 2021; Nesbit et al., 2018). Moreover, it may lead to the overburdening of informal support givers, which may hinder their participation (Van Dijk et al., 2013b).

Community organizations serve as direct resource providers to build a supportive environment and facilitate mutual support. To optimize the benefits of community-

based mutual support, interventions should focus on multi-level strategies that not only establishing the community environment but also accounting its interaction with individuals. Developing community-based interventions that foster social networks is important, as they not only facilitate older people's engagement directly but also help enhance social cohesion in the community, which further promotes mutual support and thus benefits older peoples' well-being (Greenfield, 2012; Greenfield et al., 2019). Meanwhile, community-based practices must balance the responsibility between different forms of support. Facilitating community-based mutual support requires the involvement of social workers (e.g. community coordinators), informal support givers (e.g. older people), and healthcare professionals (e.g. nurses). To integrate mutual support into care systems, effective collaboration among three stakeholders is needed. Clarifying the responsibility boundaries is also important. The distinction between volunteering and informal support is often blurred in this thesis. In the literature, volunteering is typically structured and mediated through organizations, whereas informal support emerges naturally within personal networks (Kahana et al., 2013). Yet, in practice, these boundaries are not always clear, as informal support givers may engage in structured support, while volunteers may also develop personal, informal ties with those they assist. Yet, failing to recognize these differences can lead to inefficiencies, unrealistic expectations, and mismatched interventions. Therefore, community-based practices aimed at fostering mutual support should carefully distinguish between different forms of support, ensuring they complement rather than conflict with each other.

Moreover, reducing access inequalities should be considered. For example, empty-nested older people from rural areas are more likely to encounter financial and geographic barriers to community infrastructures and organized community initiatives, which constrain their opportunity to engage with mutual support and gain benefit from it. Similarly, older people with immigrant backgrounds, often experience language barriers, discrimination, and less sense of belonging, thus are less likely to proactively participate in their resided communities (Reyes, 2023). These various challenges can lead to social isolation and reduced access to community-based mutual support, although these groups often have more needs for support. Targeted intervention design that takes these structural and cultural factors into account is important, as it provides equal opportunities for older people with different backgrounds to engage with mutual support, and contributes to building a more inclusive society (Greenwood et al., 2017).

From the policymaker's perspective, an active aging agenda, in which older people are viewed from a positive perspective, needs to be incorporated into the policy framework. Practices that encourage the active participation of older should be encouraged. Furthermore, it is crucial to implement policy change to enable a supportive environment

for community-based mutual support, by integrating it into broader health and social care systems. Community-based mutual support should not be viewed as an informal alternative to the current care systems, but rather as a complementary community-based approach. To achieve this, strong support from the macro level is essential. This will help ensure the facilitation of community-based mutual support does not shift the responsibility for care provision from the public sector to communities and individuals, which may perpetuate injustices (Martinson & Minkler, 2006). With strong and consistent government support, it is possible to avoid the potential pitfalls of devolution, thus creating a more equitable and effective care environment.

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CHAPTER 7

Summary and samenvatting

SUMMARY

As the global population is aging and pressure on formal care is increasing, a more sustainable health and social care system that balances between formal and informal support and between reducing healthcare costs and maintaining care quality is needed. Programs stimulating community-based mutual support, where older people provide help to each other within their communities, are developing fast as an attempt to address the healthcare cost issues and promote active aging. Yet, there is a lack of understanding of how community-based mutual support develops from theory to practice. This thesis aims to contribute to the understanding of community-based mutual support, by investigating the mechanisms that facilitate older people's participation in mutual support, and its influence on the psychosocial health among community-dwelling older people.

In **Chapter 2,** we focused on Chinese older people and investigated the interactions between community-based mutual support and family support, and how they influence older people's psychosocial health. Specifically, we took the financial support older people received from their adult children as the indicator of family support, and examined its relationship with older people's psychosocial health, indicated by the depressive symptoms. In addition, we tested the mediating role of social participation, which serves as a broad indicator of community-based mutual support, in the relationship between financial support and depressive symptoms. To investigate the research questions, we utilized a large-scale dataset called the China Health and Retirement Longitudinal Study (CHARLS) and employed a longitudinal analysis with two waves of data.

Our results showed that receiving financial support from adult children was negatively associated with depressive symptoms in both the short and long term, revealing the benefits of financial support from family for older people's psychological health. Furthermore, we found that participation in social activities serves as a partial mediator in the short-term, and a full mediator in the long-term, in the relationship between financial support and depressive symptoms. These results reveal the mechanism through which family support interacts with older people's active engagement with the community. The main conclusion was that family support and financial security are important for the psychological health of older people. Facilitating social participation could be an effective way to improve psychological health for older people.

Chapter 3 focused on the reciprocity of mutual support behavior and its psychosocial impacts on community-dwelling older people. Data on older people from 11 European countries in the Survey of Health, Ageing and Retirement of Europe (SHARE) were used in this study. We conceptualized mutual support reciprocity as the balance between

support giving and receiving that occurred with non-relatives across six years, then examined its relationships with the subjective well-being of community-dwelling older people, indicated by quality of life, depressive symptoms, and life satisfaction. Balanced support refers to equal intensity of support giving and receiving, while imbalance support refers to the amount of support given and received being disproportionate. We first compared the effects of balanced support to imbalanced support on subjective well-being. Results showed no difference in the effects on quality of life, depression, and life satisfaction between the two groups. We further separated support into three categories: imbalanced support-giving (giving more support than receiving), balanced support (giving equal support to receiving) and imbalanced support-receiving (receiving more support than giving). Results showed that, compared to imbalanced support receiving, older people who provided balanced support or imbalanced support-giving had better subjective well-being, indicated by higher levels of quality of life and life satisfaction, and a lower level of depressive symptoms. Furthermore, giving more support than receiving tends to have the highest level of well-being, although the difference from balanced support was not significant. The findings of this study underscore the positive impact of active participation in mutual support among older people in the community. Practices that encourage older people's participation in informal support provision within the community are worth investing in.

The study in **Chapter 4** identified the mechanisms through which older people are facilitated by community-based initiatives to participate in mutual support. We conducted a qualitative multiple-case study to investigate the experiences and perspectives on older people's participation in mutual support of different stakeholders from five community-based initiatives in the Netherlands. Results reveal facilitating mechanisms at multiple levels. At the individual level, older people are stimulated to participate in informal support provision in the community when they have and are aware of relevant abilities, are motivated, and have the opportunity to participate. The individual mechanism reflects the ability-motivation-opportunity (AMO) model in HR research (Marin-Garcia & Tomas, 2016), indicating that older people's supporting behavior occurs when their ability, motivation and opportunity are all present. Social cohesion at the community level strengthens these individual factors, while community-based initiatives at the organizational level contribute by providing a bundle of activities and facilities that stimulate both the individual and the community levels.

The results of this study are consistent with the self-esteem enhancement theory (DuBois et al., 2009). Providing support to those outside the family not only enhances older people's subjective well-being but also aligns with the broader goal of promoting active

aging. These findings highlight the potential of community-based mutual support for promoting active aging and aging in place.

Based on the findings above, **Chapter 5** investigates the effect of mechanisms through which the social community affects community-based mutual support and their effect on the well-being of community-dwelling older people. Specifically, we examined the predictive effect of support provision and social cohesion on older people's well-being, the reciprocal relationships between social cohesion and support-giving behavior, and the mediation mechanisms between social cohesion, support-giving behavior to affect well-being. To test these relationships, we employed a two-wave longitudinal survey design with community-dwelling older people in the Netherlands. Multivariate auto-regressive linear regressions showed that support provision and social cohesions at baseline were positively associated with the increase of well-being, indicating the predictive roles of support provision and social cohesion on older people's well-being. Further analyses using structural equation modelling (SEM) showed that there are no significant reciprocal relationships between social cohesion and support-giving behavior. In addition, we did not find significant mediation paths through social cohesion and support-giving behavior to well-being. However, neighborhood cohesion has a significant effect on support-giving, even when the auto-regressive effect of support-giving at baseline was taken into account. This suggests a predictive role of cohesion on the behavior of providing support to the neighborhood. Overall, the findings of this survey study suggest that the behavior of participation in support provision to the community and perceived social cohesion are both beneficial to older people's well-being. Importantly, although the interaction between support provision and perceived social cohesion may not build causal mechanisms to benefits older people's well-being, perceiving strong social cohesion can stimulate the participation in support provision in the community. Building cohesive community environment is important for facilitating social engagement for older people, thereby promoting active aging.

In the general discussion presented in **Chapter 6**, the main findings of studies in this thesis are described. Furthermore, an in-depth discussion regarding our findings is presented. Specifically, we developed three main themes: the active aging perspective of community-based mutual support, the role of social cohesion for mutual support, and contextualizing community-based mutual support in care systems. The third theme contains two sub-themes, positioning community-based mutual support in care systems, and access to community-based mutual support, were discussed. Furthermore, we reflected on the methodological considerations, including conceptualization considerations of community-based mutual support and social cohesion, and strengths

as well as limitations of this thesis. In addition, we presented recommendations for future research. Finally, implications for practice and policy were discussed.

This PhD thesis employed different research methods to investigate community-based mutual support from multiple levels of perspectives from individual to community. This thesis demonstrates that facilitating community-based mutual support has the potential to promote active aging, which benefits not only older people but also the community. However, further theoretical understanding of the facilitating mechanisms and the broader outcomes is needed. Furthermore, the positioning of community-based mutual support in the care systems and the access to it needs to be considered in the implementation of related community-based approaches. Policy reforms promoting active aging and aging in place need to take these considerations into account carefully, as they are crucial to ensure that the practices meet the needs of older people and can be accessed equally to everyone, regardless of their socioeconomic status and political-cultural backgrounds.

SAMENVATTING

Nu de wereldbevolking vergrijst en de druk op de formele zorg toeneemt, is er behoefte aan een duurzamer systeem voor gezondheidszorg en sociale zorg dat een evenwicht vindt tussen formele en informele ondersteuning en tussen het verlagen van de kosten voor gezondheidszorg en het handhaven van de kwaliteit van de zorg. Programma's die op de gemeenschap gebaseerde wederzijdse ondersteuning stimuleren, waarbij ouderen elkaar hulp bieden binnen hun gemeenschap, ontwikkelen zich snel in een poging om de kosten van de gezondheidszorg aan te pakken en actief ouder worden te bevorderen. Toch is er een gebrek aan inzicht in hoe community-based wederzijdse ondersteuning zich ontwikkelt van theorie naar praktijk. Deze dissertatie heeft als doel bij te dragen aan het begrip van onderlinge steun in de gemeenschap, door de mechanismen te onderzoeken die de deelname van ouderen aan onderlinge steun faciliteren en de invloed ervan op de psychosociale gezondheid van in de gemeenschap wonende ouderen.

In **hoofdstuk 2** richtten we ons op Chinese ouderen en onderzochten we de interacties tussen onderlinge steun vanuit de gemeenschap en familiale steun, en hoe deze de psychosociale gezondheid van ouderen beïnvloeden. Specifiek namen we de financiële steun die ouderen ontvingen van hun volwassen kinderen als indicator voor familiale steun, en onderzochten we de relatie hiervan met de psychosociale gezondheid van ouderen, aangegeven door de depressieve symptomen. Daarnaast testten we de mediërende rol van sociale participatie, die dient als een brede indicator van onderlinge steun vanuit de gemeenschap, in de relatie tussen financiële steun en depressieve symptomen. Om de onderzoeksvragen te onderzoeken, maakten we gebruik van een grootschalige dataset genaamd de China Health and Retirement Longitudinal Study (CHARLS) en gebruikten we een longitudinale analyse met twee gegevensgolven.

Onze resultaten toonden aan dat het ontvangen van financiële steun van volwassen kinderen negatief geassocieerd was met depressieve symptomen op zowel de korte als de lange termijn, wat de voordelen van financiële steun van familie voor de psychologische gezondheid van ouderen aantoont. Verder vonden we dat deelname aan sociale activiteiten dient als een gedeeltelijke mediator op de korte termijn, en een volledige mediator op de lange termijn, in de relatie tussen financiële steun en depressieve symptomen. Deze resultaten onthullen het mechanisme waardoor familiale steun interageert met de actieve betrokkenheid van ouderen bij de gemeenschap. De belangrijkste conclusie was dat familiale steun en financiële zekerheid belangrijk zijn voor de psychologische gezondheid van ouderen. Het faciliteren van sociale participatie zou een effectieve manier kunnen zijn om de psychologische gezondheid van ouderen te verbeteren.

Hoofdstuk 3 richtte zich op de wederkerigheid van wederzijds ondersteuningsgedrag en de psychosociale effecten daarvan op in de gemeenschap wonende ouderen. Voor dit onderzoek werden gegevens gebruikt over ouderen uit 11 Europese landen in de Survey of Health, Ageing and Retirement of Europe (SHARE). We conceptualiseerden wederkerigheid van wederzijdse steun als de balans tussen het geven en ontvangen van steun aan niet-verwanten gedurende zes jaar en onderzochten vervolgens de relaties met het subjectieve welzijn van in de gemeenschap wonende ouderen, aangeduid met kwaliteit van leven, depressieve symptomen en levenstevredenheid. Evenwichtige steun verwijst naar een gelijke intensiteit van geven en ontvangen van steun, terwijl onevenwichtige steun verwijst naar een onevenredige hoeveelheid gegeven en ontvangen steun. We vergeleken eerst de effecten van gebalanceerde steun met onevenwichtige steun op subjectief welzijn. De resultaten toonden geen verschil in de effecten op kwaliteit van leven, depressie en levenstevredenheid tussen de twee groepen. We hebben de ondersteuning verder onderverdeeld in drie categorieën: onevenwichtige ondersteuning-geven (meer ondersteuning geven dan ontvangen), evenwichtige ondersteuning (evenveel ondersteuning geven als ontvangen) en onevenwichtige ondersteuning-ontvangen (meer ondersteuning ontvangen dan geven). De resultaten toonden aan dat, in vergelijking met onevenwichtig steun ontvangen, ouderen die evenwichtige steun gaven of onevenwichtig steun gaven een beter subjectief welzijn hadden, aangegeven door hogere niveaus van levenskwaliteit en levenstevredenheid, en een lager niveau van depressieve symptomen. Bovendien hadden mensen die meer steun gaven dan ontvingen de neiging om het hoogste niveau van welzijn te hebben, hoewel het verschil met evenwichtige steun niet significant was. De bevindingen van dit onderzoek onderstrepen het positieve effect van actieve deelname aan onderlinge steun onder ouderen in de gemeenschap. Praktijken die de deelname van ouderen aan informele steunverlening binnen de gemeenschap aanmoedigen, zijn het waard om in te investeren.

Het onderzoek in **hoofdstuk 4** identificeerde de mechanismen waarmee ouderen door buurtinitiatieven gefaciliteerd worden om deel te nemen aan wederzijdse ondersteuning. We voerden een kwalitatieve meervoudige casestudy uit om de ervaringen en perspectieven van verschillende belanghebbenden van vijf buurtinitiatieven in Nederland op de participatie van ouderen in wederzijdse ondersteuning te onderzoeken. De resultaten onthullen faciliterende mechanismen op meerdere niveaus. Op individueel niveau worden ouderen gestimuleerd om deel te nemen aan informele ondersteuning in de gemeenschap als ze relevante vaardigheden hebben en zich daarvan bewust zijn, gemotiveerd zijn en de mogelijkheid hebben om deel te nemen. Het individuele mechanisme weerspiegelt het ability-motivation-opportunity (AMO) model in HR-onderzoek (Marin-Garcia & Tomas, 2016), dat aangeeft dat ondersteunend gedrag van ouderen optreedt wanneer hun vermogen, motivatie en gelegenheid allemaal aanwezig

zijn. Sociale cohesie op gemeenschapsniveau versterkt deze individuele factoren, terwijl gemeenschapsinitiatieven op organisatieniveau bijdragen door een bundeling van activiteiten en faciliteiten te bieden die zowel het individuele als het gemeenschapsniveau stimuleren.

De resultaten van dit onderzoek komen overeen met de theorie over zelfwaardering (DuBois et al., 2009). Het bieden van steun aan mensen buiten het gezin verbetert niet alleen het subjectieve welzijn van ouderen, maar sluit ook aan bij het bredere doel om actief ouder worden te bevorderen. Deze bevindingen benadrukken het potentieel van op de gemeenschap gebaseerde wederzijdse ondersteuning voor het bevorderen van actief ouder worden en "in place" ouder worden.

Gebaseerd op bovenstaande bevindingen, onderzoekt **hoofdstuk 5** het effect van mechanismen waardoor de sociale gemeenschap onderlinge steun vanuit de gemeenschap beïnvloedt en het effect daarvan op het welzijn van in de gemeenschap wonende ouderen. Specifiek onderzochten we het voorspellende effect van ondersteuning en sociale cohesie op het welzijn van ouderen, de wederkerige relaties tussen sociale cohesie en ondersteunend gedrag, en de bemiddelingsmechanismen tussen sociale cohesie, ondersteunend gedrag om welzijn te beïnvloeden. Om deze relaties te testen, gebruikten we een longitudinaal onderzoek in twee golven bij in de gemeenschap wonende ouderen in Nederland. Multivariate auto-regressieve lineaire regressies toonden aan dat ondersteuning en sociale cohesie op baseline positief geassocieerd waren met de toename van welzijn, wat wijst op de voorspellende rol van ondersteuning en sociale cohesie op het welzijn van ouderen. Verdere analyses met behulp van structural equation modelling (SEM) toonden aan dat er geen significante wederkerige relaties zijn tussen sociale cohesie en ondersteunend gedrag. Bovendien vonden we geen significante bemiddelingspaden via sociale cohesie en steungevend gedrag naar welzijn. Buurtcohesie heeft echter wel een significant effect op het geven van steun, zelfs als rekening wordt gehouden met het auto-regressieve effect van het geven van steun op baseline. Dit suggereert een voorspellende rol van cohesie op het geven van steun aan de buurt. Over het geheel genomen suggereren de bevindingen van dit onderzoek dat het gedrag van deelname aan het verlenen van steun aan de gemeenschap en waargenomen sociale cohesie beide gunstig zijn voor het welzijn van ouderen. Belangrijk is dat, hoewel de interactie tussen het bieden van ondersteuning en de waargenomen sociale cohesie mogelijk geen causale mechanismen opbouwt die het welzijn van ouderen ten goede komen, het waarnemen van een sterke sociale cohesie de deelname aan het bieden van ondersteuning in de gemeenschap kan stimuleren. Het opbouwen van een samenhangende gemeenschapsomgeving is belangrijk voor het faciliteren van sociale betrokkenheid voor ouderen, waardoor actief ouder worden wordt bevorderd.

In de algemene discussie in **hoofdstuk 6** worden de belangrijkste bevindingen van de onderzoeken in dit proefschrift beschreven. Verder wordt een diepgaande discussie over onze bevindingen gepresenteerd. Specifiek hebben we drie hoofdthema's ontwikkeld: het perspectief van actief ouder worden op gemeenschapsgebaseerde wederzijdse ondersteuning, de rol van sociale cohesie voor wederzijdse ondersteuning en het contextualiseren van gemeenschapsgebaseerde wederzijdse ondersteuning in zorgsystemen. Het derde thema bevat twee subthema's: de positionering van community-based wederzijdse steun in zorgsystemen en de toegang tot community-based wederzijdse steun. Verder hebben we gereflecteerd op de methodologische overwegingen, inclusief conceptualiseringsoverwegingen van community-based onderlinge steun en sociale cohesie, en zowel sterke punten als beperkingen van dit proefschrift. Daarnaast presenteerden we aanbevelingen voor toekomstig onderzoek. Tot slot werden implicaties voor praktijk en beleid besproken.

In deze dissertatie zijn verschillende onderzoeksmethoden gebruikt om onderlinge steun vanuit de gemeenschap te onderzoeken vanuit verschillende perspectieven, van individu tot gemeenschap. Deze dissertatie toont aan dat het faciliteren van onderlinge steun vanuit de gemeenschap het potentieel heeft om actief ouder worden te bevorderen, wat niet alleen ouderen maar ook de gemeenschap ten goede komt. Er is echter meer theoretisch begrip nodig van de faciliterende mechanismen en de bredere resultaten. Bovendien moet bij de implementatie van verwante op de gemeenschap gebaseerde benaderingen rekening worden gehouden met de plaats van op de gemeenschap gebaseerde wederzijdse ondersteuning in de zorgstelsels en de toegang ertoe. Beleidshervormingen ter bevordering van actief ouder worden en ouder worden in de plaats moeten zorgvuldig rekening houden met deze overwegingen, aangezien ze van cruciaal belang zijn om ervoor te zorgen dat de praktijken voldoen aan de behoeften van ouderen en voor iedereen gelijkelijk toegankelijk zijn, ongeacht hun sociaaleconomische status en politiek-culturele achtergrond.

APPENDIX

LIST OF ABBREVIATIONS

AMO	Ability-motivation-ability
ADL	Ability of Daily Living
CAPI	Computer-assisted Personal Interviews
CES-D	Center for Epidemiologic Studies Depression Scale
CHARLS	China Health and Retirement Longitudinal Study
CI	Confidence Internal
CLPM	Cross-lagged Panel Modelling
FIML	Full Information Maximum Likelihood
HCBS	home and community-based services
IADL	Instrumental Ability of Daily Living
LISS	Longitudinal Internet Studies for the Social Sciences
LMICs	low- and middle-income countries
MICE	Multiple Imputations by Chained Equations
QoL	Quality of Life
SHARE	Survey of Health, Ageing, and Retirement of Europe
SPF	Social Production Function Instrument
SPF-IL	Social Production Function Instrument of the Level of Well-being
SRH	Self-rated Health
SD	Standard Deviation
SEM	Structural Equation Modelling
VIF	Variance Inflation Factors
WMO	Wet maatschappelijke ondersteuning
WHO	World Health Organization

PHD PORTFOLIO

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PhD period	2021 – 2025
Promotor	Prof.dr. Robbert Huijsman
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Courses	**ECTs**	**Year**
Open Science	2.5	2025
Survey design	2	2023
Self-presentation: focus, structure, interaction and visualisation	2.5	2022
Brush up your SPSS skills	1	2022
Qualitative interview techniques	2	2022
Shup up and write	1	2022
Brush up your research design	2.5	2021
How to finish your PhD in time	2.5	2021
Searching and managing your literature	1	2021
Professionalism and Integrity in research	1.5	2021
How to get your article published	2.5	2021
Academic Writing	2.5	2021
Qualitative coding and analysis of textual data with Atlas.Ti	1.5	2021
Maximise your visibility as a researcher	1	2021
Activities		
Translation for Hospital management delegation from Health Human Resources Development Center, National Health Commission, China		2024
Department Science Clubs		2021-2025
ESHPM day		2022-2024
Peer review		
GSA Annual Meeting 2025 Abstract Peer Review		2025
Scientific Reports		2025
Aging International		2025
Humanities and Social Sciences Communications		2025
BMC Geriatrics		2024
BMC Public Health		2024

List of publications

This thesis:

Xia W, van Wijngaarden J D H, Huijsman R, et al. Effect of receiving financial support from adult children on depression among older persons and the mediating role of social participation. International journal of environmental research and public health, 2022, 19(19): 12974.

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Xia W, Huijsman R, Jeroen D.H. van Wijngaarden, PhD, et al. Relationships between support provision, social cohesion and belonging, and well-being among community-dwelling older people: a longitudinal survey study

Other publications:

Chen S, Tan Z, **Xia W**, et al. Theta oscillations synchronize human medial prefrontal cortex and amygdala during fear learning. Science advances, 2021, 7(34): eabf4198.

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Wenran Xia (夏文然) was born on 17th January 1995 in Zhaotong (昭通), Yunnan Province, China. After graduating from Zhaotong First High School in 2012, she started her study majoring in Nursing Science in Tianjin Medical University in Tianjin, China, and obtained her Bachelor's degree in Medicine in 2017. In the same year, she started her Master's study in Cognitive Neuroscience at the Psychology Institution of Chinese Academy of Sciences in Beijing. In 2020, she obtained her Master of Science degree with a thesis on neurocircuit mechanisms of the extinction of human fear memory. Since February 2021, Wenran started as a PhD researcher at Erasmus School of Health Policy & Management in Erasmus University Rotterdam, the Netherlands. Her research during the PhD trajectory mainly focusses on active aging, with a particular focus on community-based mutual support among older people, which resulted in this dissertation. The research led to several publications in international peer reviewed journals. Wenran determines to develop her career in the health-related field in academia.

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