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Social capital, health status, and sociodemographic factors associated with subjective well-being among older adults: a comparative study of community dwellings and nursing homes

Yan Chen^{1,2*}, Dahui Wang¹, Wenhao Chen¹, Enxi Zhao¹, Wanjing Li¹, Shanshan Zhu¹ and Xianlan Wu¹

Abstract

Background This study aimed to examine the differences in relationships among social capital components, health status, sociodemographic characteristics, and subjective well-being (SWB) among older adults in institutionalized versus non-institutionalized care environments.

Methods A cross-sectional survey was conducted involving 1,037 older adults aged 65–95 years from nine communities and nine nursing homes across three regions of Zhejiang Province, China. Social capital and SWB were assessed using the Social Capital Scale and the Memorial University of Newfoundland Scale of Happiness (MUNSH), respectively. Propensity score matching (PSM, 1:1, caliper width 0.02) was applied to balance key sociodemographic characteristics and health status between community-dwelling and nursing home residents. Multivariable linear regression was utilized to analyze the relationships among social capital components, health status, sociodemographic factors, and SWB in both groups.

Results PSM identified 290 older adults in community dwellings and a comparable group ($n = 290$) in nursing homes. Comparative analysis showed that nursing home residents demonstrated lower SWB. Multivariable linear regression revealed that social connection, trust, and cohesion were positively associated with SWB in both groups. However, social participation was only significantly linked with community dwellings residents. Both groups showed a positive relationship between SWB and self-rated health, but the number of chronic conditions did not show a significant link with SWB. Additionally, higher income (≥ 3000 RMB) and a middle school education linked to higher SWB among community-dwelling older adults, whereas family structure, specifically being not in union and having three or more children, was associated with lower SWB in the nursing home group.

Conclusion Social capital and health status showed a strong and consistent association with SWB in both groups. Strengthening social connections, trust, and cohesion, along with maintaining positive health perceptions, is expected to enhance the well-being of older adults, particularly for those in institutional settings. Notably, differences in how sociodemographic factors influence SWB across settings. These findings indicate the necessity

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for tailored interventions that address the unique needs of each care environment to promote healthier aging experiences.

Keywords Social capital, Subjective well-being, Older adults, Community dwellings, Nursing homes, Comparative study, Propensity score matching

Background

Subjective well-being (SWB) refers to an individual's overall evaluation of themselves and their life circumstances [1], encompassing both positive and negative emotions [2], and demonstrating stability across different times and situations. A fulfilling life is characterized by a positive assessment from the individual. Pursuing SWB is a fundamental human goal [3], and policymakers are increasingly prioritizing the enhancement of SWB across various populations [4, 5]. As global aging intensifies, improving the well-being of older adults has become a key focus of economic [3, 6], health [3, 7], and social policies [3, 6], particularly in aging societies [6].

Social capital is increasingly recognized as a key determinant of well-being [8, 9]. Initially introduced by Bourdieu in 1986, social capital refers to the resources individuals gain from their social networks [10]. Over time, this concept has evolved, with Putnam emphasizing the collective nature of social capital, describing it as networks, norms, and trust that enable cooperation for mutual benefit [11]. Although definitions vary, social capital is generally seen as a multidimensional concept, consisting of structural (quantitative) and cognitive (qualitative) elements. Structural social capital includes participation in social networks and organizations, such as family, friends, and community groups, while cognitive social capital relates to trust, reciprocity, and a sense of belonging. These two aspects have distinct effects on health outcomes: structural social capital impacts physical well-being by offering access to resources and support [12], while cognitive social capital improves emotional and mental health through trust and social cohesion, reducing stress and fostering long-term psychological resilience [13, 14].

Our study categorizes social capital into structural (social participation, support, and connection) and cognitive (trust, reciprocity, and cohesion) components and examines their relationships with SWB among older adults. Although social capital is typically found to have a positive impact on health, research on its specific components and their effect on SWB has produced mixed results across different residential [15–17] and geographical context [18, 19]. For instance, studies conducted in urban and rural areas of China, respectively, have shown that social participation has been linked to SWB among urban populations in China, while trust and reciprocity

are more strongly associated with SWB in rural areas [15, 16]. Conversely, a study conducted in Japan of people residing in earthquake-renovated public housing reported different results: distrust has been tied to lower SWB, but less participation and a lack of reciprocity did not show significant effects [17]. Additionally, regional studies in Austria have found that family contact has a greater impact on SWB in rural areas compared to urban ones [20].

In light of declining birth rates and demographic changes, the occupancy rates of nursing homes are rising in several countries, including China. However, prior research indicates that institutionalized environments often negatively affect the SWB of older adults [18, 21, 22]. Although social capital was recognized as a key factor in enhancing well-being, the relationship between social capital and SWB in institutionalized versus non-institutionalized settings remains unexplored. Although existing literature widely acknowledges the positive impact of social capital on SWB [15–17], most studies have focused on community-dwelling populations, leaving a gap in understanding how social capital functions in institutionalized environments such as nursing homes.

Social capital, which includes both structural aspects (e.g., social participation, support networks) and cognitive aspects (e.g., trust, reciprocity), may have different implications depending on the living arrangement. Existing research suggests that the institutional context may amplify or diminish certain social capital components' effects on SWB. For instance, studies have found that social participation is significantly associated with higher SWB in community settings [23, 24], but its role in nursing homes is less clear, where opportunities for participation may be limited [25, 26]. Likewise, factors such as trust [27] and cohesion [21, 28] may have heightened importance in nursing homes, where residents rely more heavily on institutional care and peer relationships [27]. Furthermore, nursing home residents are often older [18, 22], in poor health [18, 22], and face different social dynamics, such as the absence of a partner or family [18, 29]. These factors can modify the way social capital interacts with their SWB compared to community-dwelling older adults, whose broader social networks and more active lifestyles typically enhance structural social capital. Therefore, it is essential to investigate how both structural and cognitive dimensions of social capital impact

SWB across different care environments and whether specific components like social participation, support, or trust are more influential in institutionalized settings.

In addition, previous studies have shown that individual characteristics such as age [30, 31], gender [32], marital status [29], education [33, 34], income [35, 36], and health status [18, 36] also may influence the relationship between social capital and SWB. Given these complexities, accurately assessing the impact of different living arrangements on social capital and SWB requires careful balancing of these sociodemographic and health factors. However, achieving such alignment in real-world settings is challenging and may raise ethical concerns.

To address this, we employed Propensity Score Matching (PSM) to balance key sociodemographic characteristics (age, gender, education, marital status, and income) and health status (chronic diseases, self-rated health) between older adults in community housing and nursing homes. PSM is a statistical technique used to reduce bias by matching participants from different groups (in this case, those living in community housing vs. nursing homes) based on their similar propensity scores, which are estimated from a set of observed covariates. This approach makes observational studies more similar to randomized controlled trials by ensuring that the groups are comparable on important characteristics [37, 38]. By minimizing selection bias, PSM allows for a more accurate comparison of the effects of social capital on SWB in these two living environments.

Given the importance of social capital in influencing SWB and the diverse settings in which older adults live, this study aims to explore the relationships between social capital, sociodemographic characteristics, health status, and SWB among older adults living in community dwellings and nursing homes. By employing PSM to control for key sociodemographic and health variables, we aim to isolate the effects of care settings on SWB. Specifically, we seek to clarify how structural (e.g., social participation and support) and cognitive (e.g., trust and reciprocity) social capital influence SWB in different living environments. Additionally, we aim to identify whether certain social capital factors, such as social participation or trust, have a stronger impact in nursing homes compared to community settings, where social networks and support systems may differ significantly. This analysis provides a clearer understanding of how caregiving settings impact older adults' well-being and offers targeted recommendations for enhancing SWB in both institutional and community settings.

Methods

Design and participants

This study builds on our previous research [39], which involved a cross-sectional survey conducted between July and October 2021 in Zhejiang Province, China. A three-stage stratified cluster sampling method was employed. First, three cities—Hangzhou (high economic level), Huzhou (medium economic level), and Lishui (low economic level)—were selected based on their economic development status. Second, within each city, three districts representing high, medium, and low levels of urbanization were randomly chosen. Finally, from each district, one community dwelling and one nursing home were randomly selected, resulting in a total of nine community settings and nine nursing homes. Following Pearmain's empirical rule, 80 elderly individuals were sampled from each setting, yielding a total of 1,440 participants. With the support of community and nursing home administrators, participants were recruited through convenience sampling and completed face-to-face interviews. Interviews were conducted by a team of eight trained undergraduate students from the School of Public Health at Hangzhou Normal University. The inclusion criteria were as follows: (1) aged between 65 and 95 years, (2) possessing clear awareness and the ability to communicate effectively with investigators, and (3) providing informed consent. The sample selection process involved removing invalid questionnaires, adhering to the inclusion criteria, and performing PSM to balance the two groups. Ultimately, 291 pairs of elderly individuals (291 from community dwellings and 291 from nursing homes) were included in the final analysis. The detailed sample selection process is illustrated in Fig. 1.

Measurement

SWB

The Memorial University of Newfoundland Scale of Happiness (MUNSH) was used to assess the participants' SWB. It was created by Kozma et al. and was originally used in Newfoundland in 1980 for individuals aged 65–95 [40]. The Chinese version of the MUNSH has been applied to the study of SWB among older adults in China and has shown good reliability and validity [41, 42]. It consists of 24 items divided into four subscales: positive affect (PA), negative affect (NA), positive experience (PE), and negative experience (NE). Ten of the 24 items reflected PA and NA, and 14 items reflected PE and NE. Participants were asked if they had experienced the emotions described in the items over the past few months. The MUNSH was scored as follows: Yes = 2; Don't Know = 1; No = 0. Item 19: Present Location = 2; Other Location = 0.

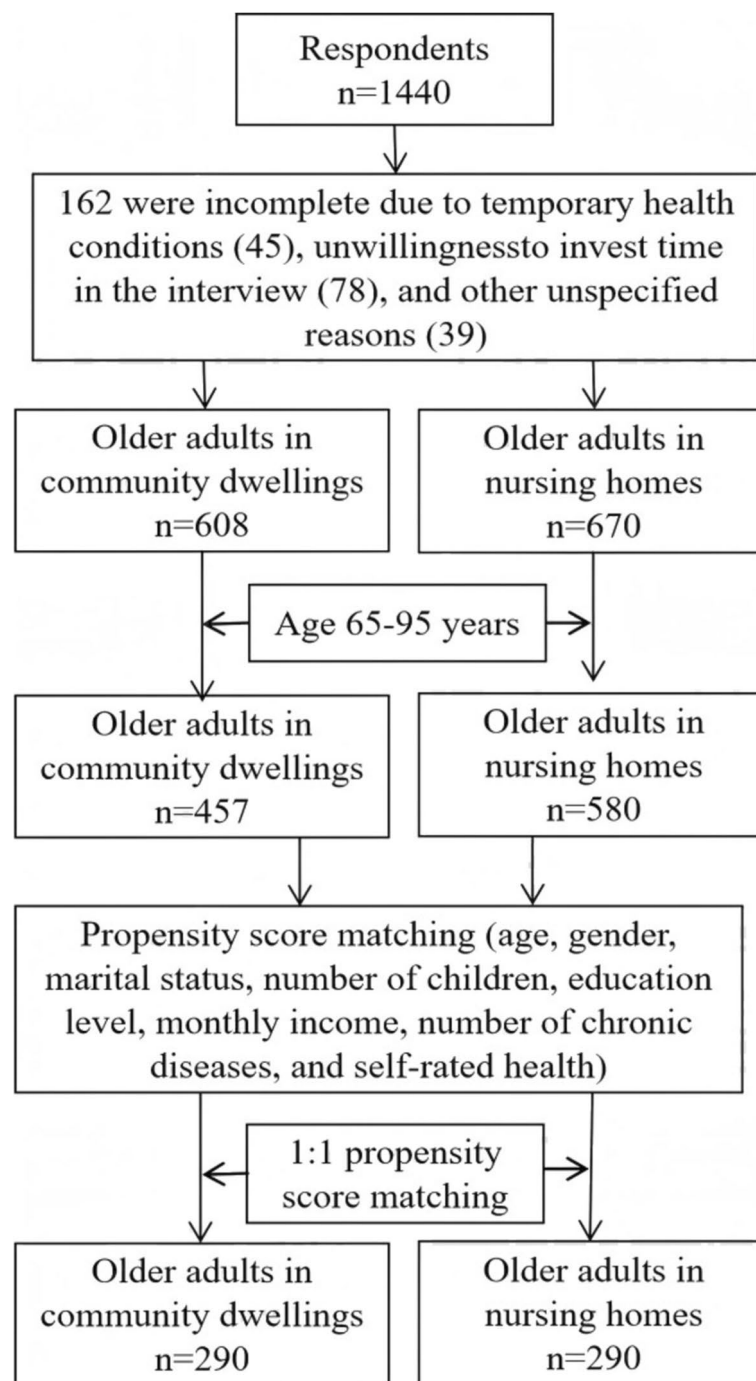


Fig. 1 Flow diagram for sample selection and propensity score matching process

Item 23: Satisfied = 2; Not Satisfied = 0. Total score of MUNSH = (PA—NA) + (PE—NE) [40]. Typically, a constant of 24 is added to the total score. Therefore, the final scores ranged from 0 to 48 [1, 43]. Higher final scores or higher levels indicate a more satisfied state [44]. Cronbach's α for the MUNSH scale in this study

was 0.71. The details of the SWB measurement are provided in Table S1.

Social capital

The social capital scale was based on the World Bank's Social Capital Assessment Tool and previous studies.

This scale has been used in studies on older populations in China and has good reliability [39, 45]. The Social Capital Scale includes six dimensions: social participation, social support, social connection, trust, cohesion, and reciprocity. Social connection, social participation, and social support reflect structural social capital, whereas trust, cohesion, and reciprocity reflect cognitive social capital. The total scale has 24 items, of which four reflect social participation, four reflect social support, three reflect social connection, three reflect trust, five reflect cohesion, and three reflect reciprocity. The social capital questionnaire used a 5-point Likert scale (1=never, 2=rarely, 3=usually, 4=often, 5=more often), in which respondents were asked to rate their level of agreement. The higher the score of each dimension, the better the social capital status of the corresponding dimension [46]. The Cronbach's α of six subscales in this study ranged from 0.762 to 0.885.

Covariates

The sociodemographic factors included age (65, 75, and 85–95 years old), gender (male vs. female), marital status (currently in union vs. not in union for single, widowed, and divorced), number of children (0–1, 2, and ≥ 3), educational level (low [0–6 years], middle [7–9 years], and high [10+ years]), monthly income (less than 3000 RMB vs. 3000 RMB or more), and number of chronic diseases (0, 1, and ≥ 1). Self-rated health was recorded on a standard 5-point Likert scale (1–5: very poor–excellent) [34]. Typically, self-rated health was recoded as a dichotomous variable, with very poor, poor, or fair categorized as one group and good or excellent categorized as another [47].

Propensity score matching (PSM)

The process of implementing PSM includes several steps: first, we calculate the propensity score for each participant based on multiple sociodemographic characteristics (such as age, gender, education, marital status, and income) and health status (such as chronic diseases and self-rated health). The propensity score represents the probability of each participant being assigned to a particular group (community or nursing home), given the influence of these covariates. Next, we used a matching caliper of 0.02 and 1:1 nearest neighbor matching to match community dwellers with nursing home residents, ensuring that the two groups were as similar as possible on the relevant variables. The matched samples comprised 290 older adults from community dwellings and 290 from nursing homes, respectively, and were subsequently included in the final outcome comparison. Finally, we conducted post-matching analyses to compare the components of social capital, SWB, and the impact of social capital, individual characteristics, and health on

SWB between the two groups. Baseline characteristics (age, gender, marital status, number of children, educational level, monthly income, number of chronic diseases, and self-rated health) were compared between the two groups to assess the balance achieved after matching.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics 26.0 (IBM Corp., Armonk, NY, USA). The distribution (%) or mean (SD) of all variables included in the study was calculated by the type of residence (community dwellings and nursing homes). Chi-square tests, T-tests, or Mann–Whitney U tests were conducted to examine differences in sociodemographic characteristics, health status, and social capital between the two groups. T-tests, one-way ANOVA, Mann–Whitney U tests, or Kruskal–Wallis H tests (H) were employed to examine differences in social capital across sociodemographic characteristics and health status within each group. Multivariable linear regression models [48] were used to identify factors associated with SWB, with results reported as regression coefficients and their 95% confidence intervals (CIs). Given the complex and potentially correlated nature of the variables involved, stepwise multivariable linear regression was chosen to systematically select the most significant predictors of SWB. This approach helps improve model parsimony by including only those variables that contribute meaningfully to explaining the variance in SWB, thereby reducing potential overfitting and multicollinearity issues [49]. The adjusted models, derived using stepwise regression, controlled for potential confounders, including sociodemographic variables (age, gender, marital status, number of children, educational level, and monthly income) and health status (number of chronic conditions and self-rated health). Variables with p -values greater than 0.05 were excluded from the final models. The Variance Inflation Factor (VIF) was used to assess multicollinearity among the independent variables in the regression model. All statistical analyses were two-tailed, and significance was set at $P \leq 0.05$.

Results

Characteristics of the studied population

Table 1 presents the sociodemographic factors, health status, social capital, and SWB of the matched samples, along with the quality of PSM. The PSM process matched 290 older adults living in community dwellings with a comparable group of 290 residents in nursing homes. After matching, we achieved a good balance for covariates such as age (65.9% vs. 57.2% aged 65–74), gender (47.2% vs. 44.8% male), marital status (67.2% vs. 69.0% currently in union), number of children (51.7% vs. 44.5% with one or none), educational level (46.9%

Table 1 Characteristics of the matched samples and PSM quality

Variable	Total samples	Community dwellings (n = 290)	Nursing homes (n = 290)	Differences between two groups χ^2 / t / U
	Mean (SD) / N (%)			
Age (years)				
65–74	357 (61.6%)	191 (65.9%)	166 (57.2%)	$\chi^2 = 4.681$
75–84	187 (32.2%)	84 (29.0%)	103 (35.5%)	
85–95	36 (6.2%)	15 (5.2%)	21 (7.2%)	
Gender				$\chi^2 = 0.340$
Male	267 (46.0%)	137 (47.2%)	130 (44.8%)	
Female	313 (54.0%)	153 (52.8%)	160 (55.2%)	
Marital status				$\chi^2 = 0.198$
Currently in union	395 (68.1%)	195 (67.2%)	200 (69.0%)	
Not in union ^a	185 (31.9%)	95 (32.8%)	90 (31.0%)	
Number of children				$\chi^2 = 3.048$
0–1	279 (48.1%)	150 (51.7%)	129 (44.5%)	
2	224 (38.6%)	104 (35.9%)	120 (41.4%)	
3–	77 (13.3%)	36 (12.4%)	41 (14.1%)	
Educational level				$\chi^2 = 5.087$
Low (0–6 years)	295 (50.9%)	136 (46.9%)	159 (54.8%)	
Middle (7–9 years)	135 (23.3%)	78 (26.9%)	57 (19.7%)	
High (10+ years)	150 (25.9%)	76 (26.2%)	74 (25.5%)	
Monthly income level				$\chi^2 = 0.155$
0–2999 RMB	134 (23.1%)	69 (23.8%)	65 (22.4%)	
3000 RMB or above	446 (76.9%)	221 (76.2%)	225 (77.6%)	
Number of chronic diseases				$\chi^2 = 0.870$
0	129 (22.2%)	63 (21.7%)	66 (22.8%)	
1	261 (45.0%)	136 (46.9%)	125 (43.1%)	
2–	190 (32.8%)	91 (31.4%)	99 (34.1%)	
Self-rated health				$\chi^2 = 0.062$
Poor, very poor, or fair	285 (49.1%)	144 (49.7%)	141 (48.6%)	
Good or excellent	295 (50.9%)	146 (50.3%)	149 (51.4%)	
Social capital				
Social participation	7.2 (3.7)	7.3 (3.8)	7.1 (3.5)	$t = 0.647$
Social support	13.1 (3.5)	14.0 (3.7)	12.2 (3.1)	$U = -6.962^{***}$
Social connection	8.5 (2.5)	8.9 (2.5)	8.2 (2.5)	$t = 3.511^{***}$
Trust	11.5 (2.5)	12.1 (2.3)	10.8 (2.6)	$U = -6.571^{***}$
Reciprocity	10.9 (2.4)	11.4 (2.2)	10.6 (2.5)	$U = -3.971^{***}$
Cohesion	18.3 (3.5)	18.9 (3.2)	17.6 (3.6)	$t = 4.793^{***}$
SWB	33.2 (9.0)	35.7 (9.4)	30.9 (7.9)	$U = -6.724^{***}$

SD standard deviation, χ^2 chi-square test value, t t-test value, U Mann–Whitney U test value* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ ^a Not in union refers to individuals who are single, widowed, or divorced

vs. 54.8% with low level), monthly income (76.2% vs. 77.6% earning ≥ 3000 RMB), number of chronic diseases (46.9% vs. 43.1% with one), and self-rated health (50.3% vs. 51.4% good or excellent) between the groups ($P > 0.05$), indicating a high quality of matching.

Regarding social capital, with the exception of social participation, which did not differ significantly between the groups, older adults in community dwellings had higher levels of social support (13.96 vs. 12.16, $p < 0.05$), social connection (8.88 vs. 8.15, $p < 0.05$),

trust (12.13 vs. 10.78, $p < 0.05$), reciprocity (11.42 vs. 10.56, $p < 0.05$), and cohesion (18.94 vs. 17.59, $p < 0.05$) compared to those in nursing homes.

In terms of SWB, older adults in community dwellings reported higher total SWB (35.68 vs. 30.86, $p < 0.05$), positive affect (7.34 vs. 4.99, $p < 0.05$), and positive experience (10.36 vs. 8.37, $p < 0.05$), and lower negative affect (2.46 vs. 2.68, $p < 0.05$) and negative experience (3.56 vs. 3.82, $p < 0.05$) compared to their counterparts in nursing homes. Details on the SWB dimensions of the matched samples can be found in Table S2.

Differences in SWB among older adults

across socioeconomic characteristics and health status

Table 2 illustrates the variations in SWB among older adults living in community dwellings versus nursing homes across various sociodemographic characteristics. Age demonstrated a significant association with SWB in both groups. Specifically, older adults aged 85–95 reported the highest SWB (42.1) in community dwellings, whereas those residing in nursing homes reported markedly lower SWB (27.5). Gender differences in SWB were evident in community dwellings, where females (36.7) reported higher SWB than males (34.5); however, this disparity was less pronounced in nursing homes (females: 30.3, males: 31.6). The relationships between marital

Table 2 Differences in SWB among older adults with different socioeconomic characteristics and health status

Variable	Community dwellings (n = 290)		Nursing homes (n = 290)	
	Mean (SD)	Significance level (F/H/t/U)	Mean (SD)	Significance level (F/H/t/U)
Age (years)		$H = 7.484^*$		$F = 21.513^{***}$
65–74	35.4 (9.3)		33.3 (7.4)	
75–84	35.1 (9.9)		27.5 (7.3)	
85–95	42.1 (5.3)		27.5 (7.4)	
Gender		$t = -1.996^*$		$U = -1.111$
Male	34.5 (9.0)		31.6 (8.3)	
Female	36.7 (9.7)		30.3 (7.5)	
Marital status		$t = 1.633$		$U = -4.091^{***}$
Currently in union	36.3 (8.9)		32.2 (8.0)	
Not in union ^a	34.4 (10.3)		28.0 (6.7)	
Number of children		$F = 3.368^*$		$H = 37.453^{***}$
0–1	36.7 (9.4)		32.5 (7.2)	
2	35.4 (9.0)		31.4 (8.0)	
3–	32.2 (9.4)		24.2 (7.9)	
Educational level		$F = 3.812^*$		$F = 9.636^{***}$
Low (0–6 years)	34.3 (9.2)		29.3 (7.6)	
Middle (7–9 years)	37.9 (9.5)		31.1 (7.0)	
High (10+ years)	35.8 (9.3)		34.0 (8.1)	
Monthly income in RMB (US\$1 = 6.5RMB)		$t = -4.481^{***}$		$U = -5.824^{***}$
0–2999	31.4 (8.8)		26.2 (6.5)	
3000 or above	37.0 (9.2)		32.2 (7.7)	
Number of chronic diseases		$F = 2.055$		$H = 45.042^{***}$
0	35.8 (8.8)		35.0 (7.6)	
1	36.7 (8.7)		31.8 (7.3)	
2–	34.1 (10.6)		26.9 (6.9)	
Self-rated health		$t = -1.319$		$U = -5.484^{***}$
Poor, very poor, or fair	34.9 (9.9)		28.3 (6.9)	
Good or excellent	36.4 (8.8)		33.3 (8.0)	

SD Standard deviation, F ANOVA (Analysis of Variance), H Kruskal–Wallis test, t t-test, U Mann–Whitney U test

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Indicates not in union (single, widowed, or divorced)

status and health conditions with SWB varied between the two living environments. In community dwellings, older adults not in unions, those with multiple chronic diseases (two or more), or those with poorer self-rated health experienced lower SWB, whereas these distinctions were less evident in nursing homes. Additionally, relatively higher educational attainment (community dwellings: middle school 37.9; nursing homes: high school or above 34.0), higher monthly income (community dwellings: ≥ 3000 RMB 37.0; nursing homes: ≥ 3000 RMB 32.2), and having fewer children (community dwellings: 0–1 children 36.7; nursing homes: 0–1 children 32.5) were associated with higher SWB in both groups.

The relationship between social capital and SWB

Table 3 presents the unadjusted and adjusted regression coefficients for factors associated with SWB among older adults in community dwellings and nursing homes. The analysis includes the effects of social capital, health status, and sociodemographic characteristics.

The adjusted models indicate no issues with multicollinearity, as evidenced by variance inflation factor (VIF) values below 5 (Table S3). Specifically, the VIF values range from 1.084 to 1.637 in the community dwellings group and from 1.094 to 1.598 in the nursing homes group. Furthermore, the Durbin-Watson values (1.927 for the community dwellings group and 1.707 for the nursing homes group) suggest good residual independence and satisfactory model fit, with both values close to the ideal of 2. These results confirm the reliability and robustness of the predictors' relationship with SWB.

Social capital demonstrated a strong and consistent association with SWB in both groups. Social connection, trust, and cohesion were positively associated with SWB in both unadjusted and adjusted models ($p < 0.05$). However, in the adjusted model, social participation was negatively associated with SWB among older adults in community dwellings ($\beta = -0.505$, $p < 0.001$), while this relationship was not significant for those in nursing homes. Additionally, reciprocity and social support did not show significant associations with SWB in either group.

The relationship between health status and SWB

In adjusted Model, a consistent association between health status and SWB was observed in both groups. Self-rated good or excellent health was significantly linked to higher SWB among older adults in both community dwellings ($\beta = 2.248$, $p < 0.05$) and nursing homes ($\beta = 1.682$, $p < 0.05$). However, the number of chronic diseases showed no significant association with SWB in either group.

The relationship between sociodemographic factors and SWB

In adjusted Model, sociodemographic factors demonstrated differing associations with SWB across the two groups. For older adults in community dwellings, middle-level education ($\beta = 2.290$, $p < 0.05$) and a monthly income of 3000 RMB or above ($\beta = 2.829$, $p < 0.05$) were positively associated with SWB. Differently, for those in nursing homes, factors such as being not in union ($\beta = -1.987$, $p < 0.001$), being aged 74–84 ($\beta = -2.376$, $p < 0.05$), and having three or more children ($\beta = -3.943$, $p < 0.001$) were negatively associated with SWB.

Discussion

This study examined the relationships among social capital components, sociodemographic characteristics, health status, and SWB among older adults living in community dwellings and nursing homes. By employing PSM to control for key sociodemographic and health variables, we aimed to isolate the effects of care settings on well-being and to clarify the interconnections among these factors and SWB.

Our findings indicate that even after adjusting for sociodemographic and health factors, older adults in nursing homes reported lower SWB compared to those living in community settings. This supports previous research highlighting the adverse effects of institutionalized environments, such as increased social isolation, loneliness, depression, and anxiety [50, 51].

The influence of social capital on SWB is typically shaped by factors like gender, age, income, and health [19, 52]. Our study found that, after controlling for these variables, social connection, cohesion, and trust consistently correlated positively with SWB in both settings. This underscores the importance of fostering strong social relationships and community trust to enhance the well-being of older adults, regardless of their living situation.

However, the institutionalized environment may hinder the development of social capital. We observed that nursing home residents scored lower on various social capital components compared to their community-dwelling counterparts, despite similar levels of social participation. This difference may be attributed to the interaction of older adults' social relationships in these two different care settings. In China, elderly interpersonal relationships often rely on family-based structures [53, 54]. Relocation to nursing homes distances older adults from their established networks, forcing them to depend more on formal support systems, which can weaken personal connections, making it more challenging to foster intimate relationships [27]. The restrictive nature of nursing home settings often limits social activities, diminishing existing

Table 3 Unadjusted and adjusted regression coefficients for factors associated with SWB across community-dwelling and nursing home groups

Variable	Community dwellings (n = 290)		Nursing homes (n = 290)	
	Unadjusted β (95%CI)	Adjusted β (95%CI)	Unadjusted β (95%CI)	Adjusted β (95%CI)
Social capital				
Social participation	-0.329 (-0.614, -0.045)*	-0.505 (-0.768, -0.242)***	0.314 (0.057, 0.571)*	Excluded
Social support	0.746 (0.466, 1.027)***	Excluded	0.793 (0.512, 1.075)***	Excluded
Social connection	1.198 (0.779, 1.618)***	0.649 (0.217, 1.081)**	1.411 (1.085, 1.737)***	0.702 (0.380, 1.025)***
Trust	1.708 (1.281, 2.134)***	0.810 (0.302, 1.318)**	1.453 (1.141, 1.766)***	0.478 (0.138, 0.819)**
Reciprocity	1.163 (0.690, 1.635)***	Excluded	1.520 (1.197, 1.844)***	Excluded
Cohesion	1.120 (0.803, 1.438)***	0.614 (0.251, 0.978)**	1.067 (0.844, 1.289)***	0.434 (0.194, 0.674)***
Age				
65–74 [®]	1	1	1	1
75–84	-0.386 (-2.783, 2.012)	Excluded	-5.721 (-7.539, -3.903)***	-2.376 (-3.928, -0.824)**
85–95	6.622 (1.711, 11.532)**	Excluded	-5.789 (-9.146, -2.433)**	Excluded
Gender				
Male [®]	1	1	1	1
Female	2.194 (0.031, 4.358)*	Excluded	-1.296 (-3.121, 0.530)	Excluded
Marital status				
Currently in union [®]	1	1	1	1
Not in union ^a	-1.913 (-4.220, 0.393)	Excluded	-4.166 (-6.075, -2.257)***	-1.987 (-3.547, -0.426)*
Number of children				
0–1 [®]	1	1	1	1
2	-1.241 (-3.581, 1.099)	Excluded	-1.193 (-3.036, 0.651)	Excluded
3–	-4.451 (-7.855, -1.048)*	Excluded	-8.396 (-11.002, -5.790)***	-3.943 (-6.075, -1.810)***
Educational level				
Low (0–6 years) [®]	1	1	1	1
Middle (7–9 years)	3.642 (1.041, 6.242)**	2.290 (0.056, 4.524)*	1.821 (-0.502, 4.143)	Excluded
High (10+ years)	1.535 (-1.088, 4.157)	Excluded	4.712 (2.595, 6.829)***	Excluded
Monthly income				
0–2999 RMB [®]	1	1	1	1
3000 RMB or above	5.622 (3.153, 8.092)***	2.829 (0.490, 5.168)*	6.068 (4.000, 8.136)***	Excluded
Number of chronic diseases				
0 [®]	1	1	1	1
1	0.836 (-1.971, 3.644)	Excluded	-3.162 (-5.337, -0.987)**	Excluded
2–	-1.726 (-4.746, 1.293)	Excluded	-8.040 (-10.312, -5.769)***	Excluded
Self-rated health				
Poor, very poor, or fair [®]	1	1	1	1
Good or excellent	1.453 (-0.716, 3.621)	2.248 (0.335, 4.161)*	4.977 (3.248, 6.706)***	1.682 (0.165, 3.199)*
R ²	-	0.302	-	0.438
Δ R ²	-	0.284	-	0.424
F	-	17.406	-	31.416
p	-	< 0.001	-	< 0.001

Adjusted regression coefficients were derived using stepwise multivariable linear regression, controlling for covariates (age, gender, marital status, number of children, educational level, monthly income, number of chronic conditions, and self-rated health) specific to each group. The “unadjusted model” examines the raw relationship between independent variables and the dependent variable (SWB), without accounting for potential confounding factors. Variables marked as ‘Excluded’ were excluded from the adjusted models due to lack of statistical significance ($p > 0.05$). [®] = reference group; CI = confidence interval; ‘not in union’ refers to individuals who are single, widowed, or divorced. US\$1 = 6.5 RMB; (-) Not applicable

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

ties [18] and leading to feelings of isolation. Additionally, the standardized management practices in these

facilities can reduce residents’ autonomy [25, 26], further impacting their sense of belonging and connection [21,

28]. Therefore, it is essential to implement strategies that specifically promote intimate relationships among nursing home residents. Creating more opportunities for personal interactions and encouraging deeper connections with family and friends can help counteract the negative effects of institutionalization on social capital.

Interestingly, our study did not find a significant association between reciprocity and social support with SWB in institutionalized settings. This could reflect contextual differences in how these factors manifest. Unlike previous studies on rural elderly populations [15, 16], our research found that reciprocity did not significantly impact the SWB of urban older adults. Reciprocity, defined as mutual assistance and benefit exchange [55], may not always yield positive emotional experiences [56]. Its influence on SWB is often moderated by factors such as emotional resource enhancement [15, 16] and income levels [15, 16].

Additionally, the effect of social support on SWB varies based on type and quality. Support from family typically has a stronger positive impact [57], but in our study, we assessed social support solely in terms of material and emotional assistance, without evaluating its type or quality in detail. Furthermore, rural Chinese communities tend to have closer-knit, emotionally connected networks compared to urban settings [15], which may explain why reciprocity and social support did not significantly enhance the SWB of urban older adults in our study.

Notably, our study found a negative correlation between social participation and the SWB of older adults in community dwellings. Further analysis indicated that social participation was positively correlated with negative affect and negative experience (details can be found in Table S4), suggesting that, in non-institutionalized settings, it may lead to social pressure or conflict. Factors such as socialization barriers [58], fall worry [59], and time constraints [60] could also influence this relationship.

Our investigation into the relationship between health status and SWB showed consistent results across both care settings: SWB was positively correlated with self-rated health but not with the number of chronic conditions. This suggests that SWB is influenced more by individuals' perceptions and understanding of their health status than by the objective burden of chronic illness. Even those with chronic conditions can experience high SWB when they manage their health effectively and receive adequate support [61].

Significant differences emerged in how sociodemographic characteristics relate to SWB across care environments. In nursing homes, family structure had a strong impact on SWB, particularly among individuals without partners or those with three or more children,

who reported lower SWB. This finding aligns with disengagement theory [62], indicating that limited social networks in nursing homes are insufficient to compensate for the lack of emotional family ties.

In contrast, older adults in community settings maintained greater social interactions and family connections, reducing the impact of family structure on their SWB. We also identified a U-shaped relationship between age and SWB in nursing homes, with the 75–84 age group reporting significantly lower SWB compared to the 65–74 age group. This decline may be attributed to health deterioration and role loss during this transitional period, whereas those aged 85 and older tend to have adapted to their care needs and developed better coping mechanisms [63, 64].

Among the elderly in community dwellings, higher SWB was typically associated with those who had higher incomes and moderate educational attainment. This may have been due to their greater access to resources, social participation, and life opportunities, which allowed them to better meet their daily needs and fulfill social role expectations [65, 66]. However, individuals with higher education may have faced greater self-expectations, and if these expectations were unmet, their SWB may have been negatively impacted [67]. In contrast, no significant relationships were found between personal income or educational level and SWB in nursing home residents, possibly due to standardized living conditions that lessen the impact of socioeconomic factors [68].

Overall, this study underscores the pivotal role of social capital, health status, and sociodemographic factors in shaping the SWB of older adults in both institutionalized and non-institutionalized settings. By employing PSM to balance key characteristics and minimize biases, our findings highlight the necessity of context-specific strategies to address the unique challenges faced by older adults in different living environments. Future research should prioritize longitudinal investigations to examine the long-term effects of social capital and health interventions on SWB or explore how cultural differences shape these relationships in various care settings. Additionally, actionable steps for stakeholders are crucial to translating these findings into practice. For instance, policymakers can develop policies that support community-based programs to strengthen social connections and support networks among older adults, with particular attention to those in nursing homes. Caregivers can receive training to foster empathy and enhance communication skills, enabling them to help older adults cultivate positive perceptions of their health and social environment. Community organizations can design inclusive activities that encourage stress-free social participation, such as skill-sharing workshops or low-impact exercise classes

tailored to the needs of older adults. Incorporating these practical recommendations will enhance the study's real-world relevance and applicability, offering actionable pathways to improve SWB and promote healthier, more fulfilling aging experiences among diverse older populations.

Limitations

This study has several limitations. First, the cross-sectional design limits conclusions about the causal relationships between social capital, health status, sociodemographic factors, and SWB. Longitudinal studies are necessary to determine the directionality and causality of these relationships. Second, the data were based on self-reports, which may be subject to recall or reporting bias. Third, although we employed PSM to balance key sociodemographic and health characteristics, residual confounding factors may still influence the observed relationships. For example, unmeasured variables such as psychological resilience or coping strategies could affect the outcomes. Fourth, our study focused on public nursing homes, and the differences between public and private facilities remain unclear. Future research should explore this aspect further. Lastly, we considered social capital components as a collective measure without a detailed analysis of specific dimensions. A more nuanced examination of these dimensions could provide deeper insights into their distinct impacts on SWB. Despite these limitations, this study contributes valuable insights into the associations between social capital, health status, sociodemographic characteristics, and SWB across institutionalized and non-institutionalized settings.

Conclusion

This study explored the relationships between social capital, health status, sociodemographic factors, and SWB among older adults in community and nursing home settings. By employing PSM to balance key characteristics, we minimized biases and focused on the distinct impacts of living arrangements on SWB. The findings indicate that older adults in nursing homes reported significantly lower SWB compared to their community-dwelling counterparts, reflecting the challenges inherent in institutionalized environments.

Social capital, particularly strong social connections, cohesion, and trust, emerged as a key factor in enhancing SWB, underscoring the universal importance of supportive social networks across care settings. Health status also played a critical role in predicting SWB, with self-rated health showing a stronger association with SWB than objective health indicators like the number of chronic conditions. This highlights the value of fostering

positive health perceptions, even among those managing chronic conditions, to sustain or improve SWB.

Sociodemographic factors had varying effects on SWB across the two care settings. In nursing homes, family structure was pivotal, with residents not in union or with multiple children reporting significantly lower SWB. In contrast, in community settings, disparities in income and educational level were more strongly associated with SWB.

These findings emphasize the importance of developing tailored interventions that address the unique needs of each care environment. Future research should investigate the longitudinal impacts of social capital and health interventions, and explore strategies to enhance SWB in older adults. Policymakers, caregivers, and community organizations can take steps to strengthen social networks, promote positive health perceptions, and provide targeted support for vulnerable groups, thereby fostering healthier and more fulfilling aging experiences across various living arrangements.

Abbreviations

SWB	Subjective well-being
PA	Positive affect
NA	Negative affect
PE	Positive experience
NE	Negative experience
MUNSH	Memorial University of Newfoundland Scale of Happiness
PSM	Propensity score matching

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12889-025-22036-4>.

Additional file 1: Table S1. Components, scoring rules, and explanations of the MUNSH scale for SWB.

Additional file 2: Table S2. SWB dimensions of the matched samples.

Additional file 3: Table S3. Variance inflation factor (VIF) values for stepwise regression models in community-dwelling and nursing home settings.

Additional file 4: Table S4. Associations between social participation and SWB dimensions among older adults in community dwellings.

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Authors' contributions

YC and DHW contributed to conception and design of the study. WHC, EXZ, and WJL performed the statistical analysis and drafted the original manuscript. SSZ and XLW collected and processed data. YC and DHW reviewed and revised the manuscript. All authors read and approved the final manuscript.

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Data availability

The datasets generated and analysed during the current study are not publicly available due to reasons of sensitivity but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval of this study was obtained from the Ethics Committee of Hangzhou Normal University (No.20210002). All methods in our study were performed in accordance with the guidelines and regulations of the Declaration of Helsinki. Informed consent was obtained from all subjects involved in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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