

• Original article •

Subjective well-being of the elderly in Xi Cheng District, Beijing

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Background: In 2010 the Beijing Municipal Government promulgated a policy aimed at improving the quality of life and subjective well-being of elderly residents that included a component focused on mental health.

Aim: Identify factors associated with subjective well-being in a representative sample of elderly residents of Xi Cheng District in Beijing.

Methods: This cross-sectional study administered a self-completion survey to a stratified random sample of 2342 residents of Xi Cheng District who were 60 to 80 years of age. The level of well-being was assessed using a validated Chinese version of the Memorial University of Newfoundland Scale of Happiness (MUNSH). Detailed socioeconomic variables were obtained using a questionnaire developed by the authors. Social support, anxiety, and depression were assessed using validated Chinese versions of the Social Support Rating Scale (SSRS), Self-rating Anxiety Scale (SAS), and Self-rating Depression Scale (SDS).

Results: Among the 2342 respondents, 1616 (69.0%) had a total MUNSH score of 32 or above, indicating a high level of happiness; 423 (18.1%) has a total SSRS score 32 or below, indicating poor social support; 201 (8.6%) had a total SDS score of 53 or above, indicating significant depression; and 126 (5.3%) had a total SAS score of 50 or above, indicating significant anxiety. In the multivariate regression analysis the self-reported level of depression was the most important factor related to well-being. Anxiety, social support, income level, the quality of family relationships, the ability to self-regulate emotions, and regular exercise were also significantly related to well-being; but gender, marital status, age and educational level were not associated with well-being.

Conclusion: Among elderly urban residents in Beijing, self-reports of poor subjective well-being are closely associated with self-reports of depressive and anxiety symptoms and also associated with social factors such as social support, income level and family relationships. Prospective studies are needed to identify the causal relationships of these variables and, based on the findings, to develop targeted interventions aimed at improving the quality of life and well-being of elderly community members.

1. Introduction

As the population ages, the health and well-being of the elderly will become an increasingly important issue for families, for health care providers, and for medical insurance systems.^[1] In 2010 the Beijing Municipal Government developed a nine-point agenda for the support of the elderly and the disabled^[2] that included a component on geriatric mental health. Evaluating this program will require ongoing assessment of the quality of life of Beijing's elderly that includes both

objective measures of physical and mental health and subjective measures of individuals' satisfaction with their quality of life. 'Subjective well-being' is a person's overall evaluation of their quality of life based on their assessment of different aspects of their lives including the physical environment, familial relationships, economic conditions and so forth; such assessments are subjective, comprehensive, and relatively stable.^[3] The current study aims to assess subjective well-being in a representative sample of Beijing's elderly.

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2. Methods

2.1 Participants

The identification of participants in the survey is shown in Figure 1. A stratified random cluster sample of community-dwelling residents 60 to 80 years of age from seven neighborhoods of Xi Cheng District in Beijing was identified. Xi Cheng District is one of the two inner-city districts of Beijing; it has a total population of 1.2 million individuals. Potential subjects were invited to the local community center or, if they did not come to the community center, visited in their homes by research assistants. In total, 2342 individuals who did not have an obvious mental illness and who provided written informed consent to participate in the survey were administered the survey instruments. The study was approved by the institutional ethics board of the Bureau of Health of Xi Cheng District of Beijing.

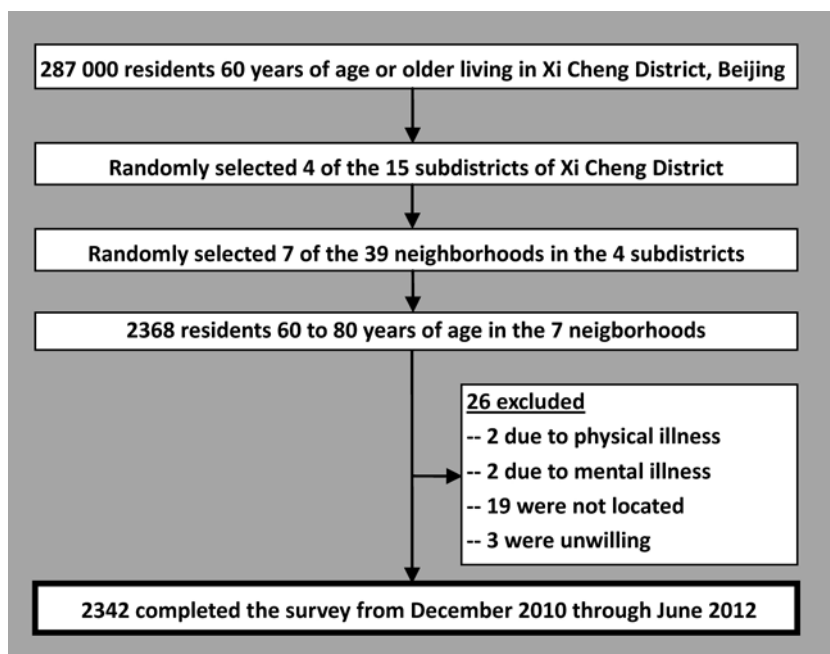
2.2 Measurement tools

A detailed demographic and life style questionnaire designed for the study included the following self-completion items: gender, age, marital status, education level, employment status, type of household, quality of family relationships, type of housing, level of personal income, type of health insurance, manner of retirement, attitude towards retirement, adjustment to retirement, number of leisure activities over the prior week (including watching television, singing and dancing, reading, playing cards, watching movies, having a pet, calligraphy, stamp collection), self-reported temperament (on an

introversion-extroversion dimension), self-report of ability to regulate one’s own emotions, smoking history, drinking history, and regularity of exercise (‘regular exercise’ was coded as present if the respondent reported at least 30 minutes of exercise twice a week). Among the 2342 respondents, 108 (4.6%) reported that they were currently employed full-time; most of these respondents had not previously retired so they did not complete the questions about retirement.

The Memorial University of Newfoundland Scale of Happiness (MUNSH)^[4] was used to assess respondents’ subjective level of well-being over the prior couple of months. (For the purposes of the current study we equate ‘subjective well-being’ to ‘happiness’ as assessed by the MUNSH.) This is a 24-item, self-completion scale with ‘yes’ or ‘no’ responses that includes five items measuring positive attitudes (PA), five items measuring negative attitudes (NA), seven items measuring positive experiences (PE), and seven items measuring negative experiences (NE). Each ‘positive’ response is scored as ‘1’ and each negative response is scored as ‘-1’, but when computing the subscale scores and total scale score these are converted to a positive range so the range of values for the PA and NA subscales scores are 0-10, the range for the PE and NE subscales scores are 0-14, and the range for the total scale score is 0-48. A total score of 32 or above is considered a high level of happiness. For the Chinese version of the MUNSH, the test-retest reliability of the total score (using Spearman’s correlation coefficient) is 0.87 and the internal validity of the 25 items in the full scale (using alpha) is 0.76.^[5]

Figure 1. Identification of survey participants



The Social Support Rating Scale (SSRS)^[4] was developed by Xiao and colleagues by adapting international scales to reflect levels of social support in China. The scale has 10 self-report items and generates four separate scores: a total score, an objective support score, a subjective (perceived) support score, and a utilization of social support score. A total score of less than 33 signifies low social support; a score of 33 to 45 signifies moderate social support; and a score over 45 signifies high social support. The internal validity of the three subscales is good ($\alpha=0.83-0.85$), but the overall internal reliability of the full scale is only fair ($\alpha=0.69$); the test-retest reliability of the total scale score is excellent ($ICC=0.92$).^[6]

The Self-rating Anxiety Scale (SAS)^[4] contains 20 items and has four subscale scores. An SAS standard score of 50 or higher denotes a high level of anxiety.^[7] The internal reliability (α) of the Chinese version of the SAS is 0.93 and the validity (correlation with the Global Assessment Scale) is 0.71. The 20-item Self-rating Depression Scale (SDS)^[4] was created by the Duke University School of Medicine in 1965. The Chinese version has an internal reliability (split-half correlation) of 0.92 and a validity (correlation with the Hamilton Depression Rating Scale) of 0.84^[4]; a score of 53 or higher denotes a high level of depression.

The questionnaires were all self-completion instruments, but for a small number of participants who were illiterate or otherwise unable to complete the questionnaires, the interviewer read the items to the respondent. On average the full battery of questionnaires took 40 minutes to complete.

2.3 Statistical methods

Fox Pro 6.0 software was used to build a database and SPSS 13.0 software was used to perform the statistical analysis. The relationship of the overall level of happiness to other variables was assessed using t-tests, ANOVA, and multiple linear regression models. When the level of happiness was significantly different across multiple subgroups, multiple comparison tests were conducted using the Tukey test. Spearman's rank correlation coefficients were used to assess the relationship of the total happiness score and the four happiness subscale scores (PA, NA, PE and NE) with the level of social support, the level of anxiety symptoms, the level of depressive symptoms, and with other continuous measures.

Five two-step linear regression analyses were conducted with the overall happiness score on the MUNSH and each of the four subscale scores as the dependent variables. In the first step, nine independent variables were forced into the model: gender, age, education (8 levels), income (8 levels), marital status (currently married vs. other), family relationships (self-rated as 'poor' vs. other), social support (SSRS total

score), anxiety (SAS total score), and depression (SDS total score). In the second step, other variables that were significant in the univariate analysis (Table 1) were entered by backward stepwise regression, so they needed to be independently related to the dependent variable to be retained in the model. Variables considered in the second step included exercise (regular exercise vs. other), current alcohol use, current smoking, frequency of leisure activities (3 levels), self-reported extroverted personality (3 levels), self-reported ability to regulate mood (3 levels), medical insurance (regular government-based insurance vs. other), home ownership, type of household (parents plus children vs. other), willingness to retire at the government-mandated age, age of retirement (at mandated age vs. other), adjustment to retirement (3 levels), current employment status (still in full employment vs. other), and profession (factory worker vs. other). In the linear regression analysis all ranked variables were treated as continuous variables. A total of 2242 cases were considered in the analyses after removal of cases with missing data.

3. Results

3.1 Characteristics of the sample

The 2342 respondents included 1067 (45.6%) males and 1275 (54.4%) females who had a mean (sd) age of 67.8 (4.9) years. Among them, 2135 (91.2%) were of Han ethnicity, 2036 (86.9%) were currently married, 1180 (50.4%) had completed high school, 1945 (83.0%) owned their own home, 369 (15.8%) had a personal monthly income of 3000 renminbi (\$480) or greater, and 2085 (89.0%) reported that their family relationships were 'good'.

Among the participants, 423 (18.1%) rated their social support as 'poor' (SSRS score <33), 201 (8.6%) had a high level of depressive symptoms (standardized SDS score ≥ 53), and 126 (5.3%) had a high level of anxiety symptoms (standardized SAS score ≥ 50). The mean (sd) score of the MUNSH was 36.0 (9.0) and the mean scores of the positive factor (PA), negative factor (NA), positive experience (PE), and negative experience (NE) subscales were 29.9 (2.8), 25.4 (2.3), 34.0 (3.5), and 26.4 (3.0), respectively. In total 1616 (69.0%) respondents had a total MUNSH score of 32 or higher, indicating that they had a high level of happiness with their current situation.

3.2 Univariate relationship of level of happiness with demographic and other factors

The relationship of the total happiness score and of the four subscale scores to the demographic and other characteristics of the respondents is shown in Table 1. The results for the total score and those for the four subscale scores varied in specific details but were generally consistent with each other. High reported overall happiness and strong positive

Table 1. Level of well-being (based on MUNSH) in 2342 elderly in Xi Cheng district, Beijing (mean [sd])

Variable	n	Positive attitude	Negative attitude	Positive experience	Negative experience	Total happiness score
Full sample	2342	29.9 (2.8)	25.4 (2.3)	34.0 (3.5)	26.4 (3.0)	36.0 (9.0)
Gender	2342					
Male	1067	29.9 (2.8)	25.2 (2.2)	34.0 (3.5)	26.3 (3.0)	36.3 (8.7)
Female	1275	29.9 (2.8)	25.4 (2.4)	33.9 (3.5)	26.5 (3.1)	35.8 (9.2)
t-test (p-value)	--	0.4 (0.695)	-0.9 (0.374)	1.0 (0.310)	-1.4 (0.173)	1.2 (0.239)
Marital status	2342					
1. Never married	26	29.7 (2.9)	25.5 (2.4)	33.8 (3.7)	26.8 (3.1)	35.1 (9.4)
2. Married	2012	29.9 (2.8)	25.3 (2.2)	34.0 (3.5)	26.3 (2.9)	36.3 (8.8)
3. Divorced	36	29.4 (3.0)	26.5 (3.0)	32.4 (4.0)	28.3 (3.7)	31.0 (10.8)
4. Re-married	24	31.2 (2.3)	25.0 (1.9)	33.9 (3.8)	26.8 (3.0)	37.3 (8.7)
5. Widowed	244	29.7 (2.8)	25.8 (2.7)	33.7 (3.7)	27.0 (3.4)	34.6 (9.8)
F (p-value)	--	2.0 (0.090)	4.5 (<0.001)	2.4 (0.049)	6.5 (<0.001)	5.0 (<0.001)
Multiple comparisons	--	---	3>4	---	3>2	4,2>3
Educational level	2342					
1. Illiterate	70	29.7 (2.9)	25.7 (2.8)	34.2 (3.5)	27.0 (3.8)	35.1 (10.3)
2. Primary school	310	29.6 (2.9)	25.8 (2.7)	33.4 (3.8)	27.0 (3.4)	34.2 (10.0)
3. Middle school	782	30.0 (2.8)	25.4 (2.2)	34.0 (3.5)	26.4 (3.0)	36.2 (8.8)
4. High school	374	29.8 (2.7)	25.6 (2.5)	33.6 (3.6)	26.8 (3.1)	34.9 (9.5)
5. Technical school	356	30.0 (2.8)	25.3 (2.2)	34.3 (3.9)	26.2 (2.9)	36.8 (8.7)
6. Community college	275	29.9 (2.7)	25.1 (2.0)	34.4 (3.3)	25.9 (2.5)	37.3 (8.1)
7. College and above	175	30.1 (2.7)	24.9 (1.8)	34.6 (2.9)	25.6 (2.2)	38.1 (7.1)
F (p-value)	--	1.1 (0.358)	4.4 (<0.001)	4.1 (<0.001)	7.5 (<0.001)	6.1 (<0.001)
Multiple comparisons	--	---	2>6,7; 1>7	7>4,2	2,1,4>6,7	7>1,4,2; 6>2
Occupation	2342					
1. Technician	466	30.1 (2.8)	25.3 (2.1)	34.2 (3.4)	26.1 (2.7)	36.9 (8.4)
2. Government worker	174	29.6 (2.6)	24.9 (1.9)	34.4 (3.0)	25.9 (2.4)	37.3 (7.0)
3. Military personnel	10	29.7 (2.7)	25.2 (3.2)	33.7 (4.1)	26.2 (3.6)	36.0 (10.9)
4. Business	69	30.7 (2.4)	25.7 (2.8)	33.4 (3.9)	26.9 (3.3)	35.6 (9.6)
5. Service staff	95	29.3 (2.9)	26.3 (2.8)	33.0 (3.9)	27.9 (4.0)	32.0 (10.2)
6. Farmer	15	28.6 (2.8)	26.3 (2.3)	32.7 (2.9)	29.1 (3.2)	29.9 (6.8)
7. Factory worker	1120	29.9 (2.8)	25.4 (2.4)	33.9 (3.5)	26.5 (3.1)	35.8 (9.2)
8. Office worker	131	30.1 (2.9)	25.1 (1.9)	34.7 (3.2)	25.7 (2.3)	38.1 (7.9)
9. Teacher	121	30.7 (2.5)	25.2 (2.1)	34.9 (3.2)	25.9 (2.9)	38.4 (8.4)
10. Unemployed	80	29.0 (2.8)	26.5 (2.9)	32.7 (4.1)	27.9 (3.8)	31.3 (11.0)
11. Other/self-employed	61	29.4 (2.5)	24.9 (1.8)	33.6 (3.6)	25.7 (2.0)	36.4 (7.2)
F (p-value)	--	3.8 (<0.001)	5.5 (<0.001)	4.1 (<0.001)	8.9 (<0.001)	7.4 (<0.001)
Multiple comparisons	--	4,9>6	10>2,11	---	6>4,7,3,1,9,2,11,8; 10,5>2,11,8	9,8>5,10,6; 2,1,11,3>6
Type of household	2342					
1. Parents and children	1307	29.8 (2.9)	25.2 (2.1)	33.9 (3.5)	26.2 (2.7)	36.4 (8.6)
2. Three generations	673	30.1 (2.7)	25.4 (2.3)	34.2 (3.3)	26.4 (2.9)	36.5 (8.3)
3. Multiple families	362	29.8 (2.7)	26.2 (2.9)	33.8 (3.8)	27.4 (3.8)	33.9 (10.9)
F (p-value)	--	2.7 (0.066)	27.8 (<0.001)	2.5 (0.079)	26.6 (<0.001)	11.9 (<0.001)
Multiple comparisons	--	---	3>2,1	---	3>2,1	2,1>3
Family relationships	2342					
1. Good	2089	30.0 (2.8)	25.3 (2.2)	34.2 (3.4)	26.3 (2.9)	36.6 (8.7)
2. Fair	218	29.1 (2.9)	26.4 (2.7)	32.5 (3.9)	27.8 (3.6)	31.5 (10.0)
3. Bad	35	28.9 (2.8)	26.5 (2.5)	31.4 (3.9)	27.7 (3.9)	30.1 (11.1)
F (p-value)	--	12.8 (<0.001)	25.8 (<0.001)	31.4 (<0.001)	26.5 (<0.001)	41.3 (<0.001)
Multiple comparisons	--	1>3	3,2>1	1>2,3	2,3>1	1>2,3

Table 1. Level of well-being (based on MUNSH) in 2342 elderly in Xi Cheng district, Beijing (mean [sd]) (cont'd)

Variable	n	Positive attitude	Negative attitude	Positive experience	Negative experience	Total happiness score
Housing/living 2342						
1. Own a house	1945	29.9 (2.8)	25.3 (2.2)	34.0 (3.5)	26.2 (2.8)	36.4 (8.9)
2. Parents' house	87	30.4 (2.6)	26.0 (2.3)	33.7 (3.7)	27.1 (3.4)	34.9 (8.2)
3. Children's house	60	29.4 (3.1)	25.8 (2.3)	33.3 (3.8)	27.4 (3.5)	33.5 (9.5)
4. Low-rent apartment	66	30.2 (2.4)	26.7(3.0)	33.7 (3.1)	28.2 (4.4)	33.0 (10.5)
5. Rented apartment	128	29.9 (2.6)	26.1 (2.5)	33.8 (3.6)	27.4 (3.6)	34.3 (9.5)
6. Other	56	30.6 (2.5)	25.7 (2.9)	34.7 (3.4)	26.5 (3.0)	37.2 (9.1)
F (p-value)	--	1.8 (0.108)	9.2 (<0.001)	1.2 (0.308)	11.7 (<0.001)	4.5 (<0.001)
Multiple comparisons	--	---	4>6,1	---	4>6,1	6>4
Income 2342						
1. <999	158	29.3 (3.1)	26.6 (2.9)	32.6 (4.1)	28.0 (3.8)	31.3 (11.1)
2. 1000-1999	546	29.8 (2.8)	25.8 (2.5)	33.6 (3.6)	26.9 (3.3)	34.8 (9.5)
3. 2000-2999	1269	29.9 (2.8)	25.3 (2.2)	34.1 (3.4)	26.3 (2.9)	36.5 (8.6)
4. 3000-3999	242	30.2 (2.6)	24.8 (1.7)	34.5 (3.3)	25.6 (2.3)	38.2 (7.4)
5. 4000-4999	93	30.5 (2.7)	24.9 (1.9)	34.6 (3.3)	25.3 (2.0)	38.9 (7.4)
6. >5000	34	30.8 (2.6)	24.8 (1.6)	34.1 (2.6)	25.9 (2.6)	38.2 (6.2)
F (p-value)	--	3.4 (0.005)	13.4 (<0.001)	8.6 (<0.001)	19.1 (<0.001)	17.4 (<0.001)
Multiple comparisons	--	6,5>1	1>3,5,6; 2>5,4,6	5,4,3,6>1	1>3,6,4,5; 2>4,5	5,4,6>2,1; 3,2>1
Health insurance 2342						
1. Fully paid by workplace	192	30.1 (2.6)	25.3 (2.4)	34.1 (3.5)	26.2 (2.9)	36.6 (8.9)
2. Government insurance	2087	29.9 (2.8)	25.4 (2.3)	34.0 (3.5)	26.3 (3.0)	36.2 (8.9)
3. Commercial insurance	7	29.1 (2.5)	26.6 (2.5)	30.9 (3.2)	28.9 (3.2)	28.6 (8.1)
4. Self-pay	56	29.4 (2.9)	27.3 (2.7)	32.7 (3.7)	29.5 (3.7)	29.2 (9.7)
F (p-value)	--	1.1 (0.358)	14.3 (<0.001)	4.5 (0.004)	22.3 (<0.001)	13.0 (<0.001)
Multiple comparisons	--	---	4>1,2	1,2>3	4,3>2,1	1,2>4,3
Manner of retirement 2248 29.9 (2.8) 25.4 (2.3) 34.0 (3.5) 26.4 (3.0) 36.2 (8.9)						
1. Retired at normal age	1884	30.1 (2.7)	25.3 (2.3)	34.1 (3.4)	26.3 (2.9)	36.5 (8.7)
2. Early retirement	306	29.3 (2.8)	25.6 (2.3)	33.4 (3.7)	26.7 (3.2)	34.4 (9.3)
3. Late retirement	37	28.9 (2.4)	25.9 (3.0)	33.1 (3.9)	26.8 (3.8)	33.3 (10.1)
4. Others	21	28.1 (3.7)	25.7 (2.3)	33.7 (3.8)	27.1 (3.3)	33.1 (10.1)
F (p-value)	--	11.6 (<0.001)	2.1 (0.101)	5.1 (0.002)	1.9 (0.129)	7.5 (<0.001)
Multiple comparison	--	1>4	---	---	---	---
Attitude toward retirement 2243 29.9 (2.8) 25.4 (2.3) 34.0 (3.5) 26.4 (3.0) 36.2 (8.9)						
1. Regulation age okay	1804	30.1 (2.7)	25.3 (2.2)	34.2 (3.4)	26.3 (2.9)	36.6 (8.6)
2. Eager to retire	215	29.4 (2.9)	25.5 (2.2)	33.6 (3.7)	26.3 (3.1)	35.2 (9.1)
3. Reluctant to retire	212	28.8 (2.8)	25.8 (2.7)	33.2 (3.9)	26.8 (3.5)	33.4 (10.1)
4. Others	12	28.9 (3.3)	25.0 (2.9)	33.4 (3.9)	26.0 (3.1)	35.3 (10.9)
F (p-value)	--	17.4 (<0.001)	3.6 (0.013)	6.0 (<0.001)	1.8 (0.147)	9.7 (<0.001)
Multiple comparisons	--	---	---	---	---	---
Adjustment to retirement 2248 29.9 (2.8) 25.4 (2.3) 34.0 (3.5) 26.4 (3.0) 26.5 (8.9)						
1. Well-adjusted	1778	30.0 (2.7)	25.3 (2.3)	34.2 (3.4)	26.3 (2.9)	36.6 (8.7)
2. Not very well adjusted	440	29.5 (2.9)	25.5 (2.2)	33.3 (3.5)	26.7 (3.1)	34.6 (9.1)
3. Cannot adjust	30	28.4 (2.7)	26.5 (3.5)	32.3 (3.1)	27.4 (4.4)	30.9 (11.7)
F (p-value)	--	11.5 (<0.001)	3.7 (0.025)	14.3 (<0.001)	5.8 (0.003)	14.2 (<0.001)
Multiple comparisons	--	1>3	3>2,1	1>3	---	1,2>3
Temperament (self-report) 2342						
1. Introvert	486	29.5 (3.0)	25.4 (2.5)	33.6 (3.6)	26.3 (2.9)	35.4 (9.4)
2. Intermediate	940	29.8 (2.7)	25.7 (2.4)	33.8 (3.6)	26.7 (3.2)	35.2 (9.2)
3. Extrovert	916	30.2 (2.7)	25.1 (2.1)	34.4 (3.3)	26.2 (2.9)	37.2 (8.3)
F (p-value)	--	11.1 (<0.001)	14.2 (<0.001)	9.8 (<0.001)	8.1 (<0.001)	13.8 (<0.001)
Multiple comparisons	--	3,2>1	2,1>3	3>2,1	2>1,3	3>1,2

Table 1. Level of well-being (based on MUNSH) in 2342 elderly in Xi Cheng district, Beijing (mean [sd]) (cont'd)

Variable	n	Positive attitude	Negative attitude	Positive experience	Negative experience	Total happiness score
Self-regulation of mood 2342						
1. Strong	1471	30.3 (2.6)	25.2 (2.2)	34.6 (3.1)	26.1 (2.8)	37.7 (8.0)
2. Medium	782	29.3 (2.9)	25.7 (2.4)	33.1 (3.7)	26.8 (3.1)	33.9 (9.5)
3. Weak	89	28.8 (3.0)	26.9 (3.2)	31.4 (4.2)	28.6 (4.0)	28.6 (11.8)
F (p-value)	--	46.6 (<0.001)	32.8 (<0.001)	78.9 (<0.001)	39.7 (<0.001)	82.7 (<0.001)
Multiple comparisons	--	1>2,3	3>2>1	1>2>3	3>2>1	1>2>3
Smoking status 2342						
1. Current smoker	362	29.8 (2.9)	25.4 (2.3)	34.1 (3.3)	26.4 (3.0)	36.1 (9.0)
2. Never smoked	1903	29.9 (2.7)	25.4 (2.3)	34.0 (3.5)	26.4 (3.0)	36.1 (8.9)
3. Previously smoked	77	29.2 (2.9)	25.4 (2.5)	32.8 (3.8)	26.4 (3.6)	34.2 (10.8)
F (p-value)	--	3.0 (0.048)	0.1 (0.894)	4.2 (0.015)	0.07 (0.930)	1.6 (0.196)
Multiple comparisons	--	2>3	---	1,2>3	---	--
Drinking status 2342						
1. Current drinker	313	29.8 (2.7)	25.3 (2.3)	34.0 (3.4)	26.2 (3.0)	36.4 (8.9)
2. Never drinks	1996	29.9 (2.8)	25.4 (2.3)	34.0 (3.5)	26.4 (3.0)	36.1 (8.9)
3. Previous drinker	33	29.0 (2.6)	26.2 (2.7)	32.4 (4.0)	27.7 (3.7)	31.5 (10.8)
F (p-value)	--	1.9 (0.157)	2.1 (0.117)	3.4 (0.032)	4.1 (0.016)	4.5 (0.011)
Multiple comparisons	--	---	---	1,2>3	3>2,1	1,2>3
Regular physical exercise 2342						
Yes	1826	30.0 (2.7)	25.3 (2.2)	34.2 (3.4)	26.2 (2.8)	36.7 (8.5)
No	516	29.7 (2.9)	25.9 (2.6)	33.3 (3.8)	27.3 (3.5)	33.8 (10.1)
t-test (p-value)	--	2.0 (0.047)	-5.8 (<0.001)	5.0 (<0.001)	-7.2 (<0.001)	6.5 (<0.001)
Regular leisure activities 2342						
1. None	85	29.1 (3.0)	25.4 (2.5)	34.0 (4.0)	25.9 (3.1)	35.8 (9.2)
2. 1-2 types of activities	1749	29.8 (2.7)	25.4 (2.3)	33.9 (3.5)	26.5 (3.0)	35.7 (8.9)
3. 3-8 types of activities	508	30.3 (2.8)	25.3 (2.2)	34.3 (3.4)	26.2 (2.9)	37.1 (9.0)
F (p-value)	--	9.9 (<0.001)	0.3 (0.726)	3.7 (0.024)	4.0 (0.018)	5.0 (0.007)
Multiple comparisons	--	2,3>1	---	---	---	---
Anxiety (SAS score > 50) 2342						
No	2216	30.0 (2.7)	25.2 (2.1)	34.1 (3.4)	26.2 (2.8)	36.6 (8.4)
Yes	126	28.5 (3.3)	28.3 (3.1)	31.0 (3.9)	29.9 (3.8)	25.3 (11.1)
t-test (p-value)	--	5.8(0.00)	-15.4 (<0.001)	9.9 (<0.001)	-13.8 (<0.001)	14.4 (<0.001)
Depression (SDS score > 53) 2342						
No	2141	30.0 (2.7)	25.1 (2.0)	34.3 (3.3)	26.0 (2.6)	37.2 (8.0)
Yes	201	28.5 (3.1)	28.5 (3.0)	30.9 (3.6)	30.7 (3.8)	24.2 (10.0)
t-test (p-value)	--	7.6 (<0.001)	-21.5 (<0.001)	13.6 (<0.001)	-23.4 (<0.001)	21.4 (<0.001)
Social support 2342						
1. Low (SSRS score <33)	423	28.7 (2.8)	26.4 (2.9)	31.8 (4.1)	27.8 (3.7)	30.3 (10.8)
2. Medium (SSRS score=33-45)	1469	30.0 (2.7)	25.2 (2.1)	34.2 (3.3)	26.2 (2.7)	36.8 (8.1)
3. High (SSRS score >45)	450	30.9 (2.5)	25.2 (2.1)	35.2 (2.6)	25.9 (2.9)	39.0 (7.4)
F (p-value)	--	76.8 (<0.001)	45.3 (<0.001)	124.0 (<0.001)	62.5 (<0.001)	130.1 (<0.001)
Multiple comparisons	--	3>2>1	1>3,2	3>2>1,	1>2,3	3>2>1
Employment status 2342						
Still working fulltime	108	29.6 (3.0)	26.1 (2.7)	33.2 (3.7)	27.5 (3.5)	33.2 (10.8)
Retired	2234	29.9 (2.8)	25.4 (2.3)	34.0 (3.5)	26.4 (3.0)	36.2 (8.9)
t-test (p-value)	--	-1.3 (0.203)	3.4 (0.001)	-2.3 (0.020)	3.7 (<0.001)	-3.4 (0.001)

MUNSH, Memorial University of Newfoundland Scale of Happiness; SAS, Self-rating Anxiety Scale; SDS, Self-rating Depression Scale; SSRS, Social Support Rating Scale

attitudes and experiences were associated with higher educational attainment, higher personal income, having government-sponsored health insurance, self-reports of good family relationships, being extroverted, being able to regulate one's mood, and regular exercise. Low reported overall happiness and strong negative attitudes and experiences were associated with divorce, being an agricultural laborer (i.e., farmer), living in a multiple-family household, living in government-supported low-rental housing, being currently still in fulltime employment, being a previous drinker, and self-reported depression, anxiety and poor adjustment to retirement. Gender, attitude about retirement and smoking history were not strongly associated with level of happiness.

The correlation of the total happiness score and the four happiness subscale scores with SDS, SAS, SSRS, age, education, and income are shown in Table 2. The measures of happiness were all strongly correlated with the level of depression and the level of anxiety (absolute value of all $r_s \geq 0.30$). The five measures of happiness were only moderately correlated with the overall social support measure (absolute value of all $r_s \geq 0.17$ and ≤ 0.30). And the correlations of happiness with income, age, and level of education – despite being statistically significant because of the large sample size – were all relatively weak (absolute value of all $r_s < 0.20$). The absolute value of the correlations of the four MUNSH subscale scores with each other ranged from 0.29 to 0.60 (average of six correlations=0.44).

3.3 Multivariate analyses

The multivariate linear regression results for the

total MUNSH happiness score are shown in Table 3. The self-reported level of depression was, by far, most closely associated with the overall self-reported level of happiness. Other important factors were the self-reported level of anxiety, social support, income level, family relationships, self-regulation of emotion, and regular exercise. Less important (but still statistically significant) factors included retiring at the government-mandated age for retirement and the number of leisure activities. Interestingly, marital status, gender, age and educational level were not independently associated with the overall level of happiness. The adjusted R^2 for the model was 0.383, indicating that the 13 variables included in the model account for 38% of the variance in overall happiness.

Table 4 shows the results of the multivariate linear regression analyses for each of the four subscales of the MUNSH, only showing the independent variables that were statistically significant. The level of depression (SDS total score) and level of anxiety (SAS total score) were significant factors in all four models. Three other factors appeared in three of the four models: level of social support (not in the model for negative attitudes); self-report of poor family relationships (not in the model for positive attitudes); and regular exercise (not in the model for positive attitudes). Not having government-based health insurance and not owning one's own home were significantly related to negative attitudes and to negative experiences. All the other statistically significant independent variables were only included in one of the four regression models. The adjusted R^2 for the four models ranged from 0.160 to 0.274.

Table 2. Correlation of happiness (MUNSH), social support (SSRS), depression (SDS), anxiety (SAS), family income, age, and level of education in 2342 elderly in Xi Cheng district, Beijing (Spearman's r_s [p-value])

	Overall happiness	Positive attitude	Negative attitude	Positive experience	Negative experience
Overall Social Support (SS)	0.30 (<0.001)	0.26 (<0.001)	- 0.17 (<0.001)	0.28 (<0.001)	- 0.22 (<0.001)
Objective SS	0.22 (<0.001)	0.08 (<0.001)	- 0.26 (<0.001)	0.13 (<0.001)	- 0.25 (<0.001)
Subjective SS	0.27 (<0.001)	0.28 (<0.001)	- 0.11 (<0.001)	0.27 (<0.001)	- 0.17 (<0.001)
Utilization of SS	0.15 (<0.001)	0.18 (<0.001)	- 0.04 (0.084)	0.17 (<0.001)	- 0.09 (<0.001)
Depression scale total score	- 0.51 (<0.001)	- 0.34 (<0.001)	0.40 (<0.001)	- 0.45 (<0.001)	0.38 (<0.001)
Anxiety scale total score	- 0.44 (<0.001)	- 0.30 (<0.001)	0.34 (<0.001)	- 0.40 (<0.001)	0.37 (<0.001)
Income	0.16 (<0.001)	0.07 (0.002)	- 0.17 (<0.001)	0.11 (<0.001)	- 0.17 (<0.001)
Age	0.04 (0.070)	0.02 (0.311)	0.07 (0.001)	- 0.00 (0.876)	- 0.05 (0.010)
Level of education	0.08 (<0.001)	0.02 (0.286)	- 0.07 (<0.001)	0.06 (0.003)	- 0.09 (<0.001)
Happiness subscale scores					
Positive attitude	0.75 (<0.001)	----	- 0.29 (<0.001)	0.58 (<0.001)	- 0.33 (<0.001)
Negative attitude	- 0.65 (<0.001)	----	----	- 0.36 (<0.001)	0.60 (<0.001)
Positive experience	0.83 (<0.001)	----	----	----	- 0.46 (<0.001)
Negative experience	- 0.74 (<0.001)	----	----	----	----

MUNSH, Memorial University of Newfoundland Scale of Happiness; SSRS, Social Support Rating Scale; SDS, Self-rating Depression Scale; SAS, Self-rating Anxiety Scale

Table 3. Multiple linear regression of the overall happiness score from the MUNSH scale of 2242 elderly persons in Xi Cheng District, Beijing (independent variables sorted in order of importance)^a

Variable	β	S.E of β	standardized Beta	t	p	95% CI of β	
SDS total score (continuous)	-0.328	0.020	-0.355	-16.61	<0.001	-0.367	-0.289
SAS total score (continuous)	-0.205	0.024	-0.183	-8.64	<0.001	-0.251	-0.158
SSRS total score (continuous)	0.194	0.025	0.143	7.73	<0.001	0.145	0.243
Personal monthly income (8 levels)	0.764	0.182	0.078	4.21	<0.001	0.408	1.121
Poor family relationships (3 levels)	-1.707	0.415	-0.071	-4.12	<0.001	-2.520	-0.893
Poor self-regulation of mood (3 levels)	-1.011	0.278	-0.064	-3.63	<0.001	-1.557	-0.465
Regular exercise	1.214	0.363	0.056	3.34	0.001	0.502	1.926
Retired at regulation age	0.999	0.405	0.041	2.47	0.014	0.204	1.79
Number of leisure activities (3 levels)	0.656	0.317	0.035	2.07	0.039	0.034	1.278
Currently married	-0.360	0.467	-0.014	-0.77	0.441	-1.275	0.556
Female gender	0.117	0.307	0.007	0.38	0.702	-0.484	0.718
Age (continuous)	0.012	0.031	0.006	0.38	0.706	-0.049	0.072
Educational level (8 levels)	-0.020	0.105	-0.003	-0.19	0.851	-0.227	0.187

MUNSH, Memorial University of Newfoundland Scale of Happiness; S.E., standard error; CI, confidence interval; SSRS, Social Support Rating Scale; SAS, Self-rating Anxiety Scale; SDS, Self-rating Depression Scale
^aSee statistical methods section for description of the analytic methods. Adjusted R² for model=0.383

Table 4. Multiple linear regression of the four subscale scores from the MUNSH scale of 2242 elderly persons in Xi Cheng District, Beijing (independent variables sorted in order of importance)^a

Variable	β	S.E of β	standardized Beta	t	p	95% CI of β	
POSITIVE ATTITUDE SUBSCALE^b							
SSRS total score (continuous)	0.071	0.009	0.168	7.78	<0.001	0.053	0.089
SDS total score (continuous)	-0.049	0.007	-0.169	-6.78	<0.001	-0.063	-0.035
Willing to retire at official age	0.678	0.137	0.097	4.95	<0.001	0.409	0.946
SAS total score (continuous)	-0.040	0.009	-0.113	-4.60	<0.001	-0.056	-0.023
Number of leisure activities (3 levels)	0.423	0.115	0.072	3.67	<0.001	0.197	0.650
Poor self-regulation of mood (3 levels)	-0.370	0.101	-0.075	-3.65	<0.001	-0.568	-0.171
NEGATIVE ATTITUDE SUBSCALE^c							
SDS total score (continuous)	0.073	0.006	0.309	13.21	<0.001	0.062	0.084
SAS total score (continuous)	0.045	0.007	0.158	6.85	<0.001	0.032	0.058
Personal monthly income (8 levels)	-0.251	0.052	-0.099	-4.85	<0.001	-0.353	-0.150
Poor family relationships (3 levels)	0.412	0.116	0.067	3.54	<0.001	0.184	0.641
Parents and children family household	-0.290	0.085	-0.063	-3.41	0.001	-0.456	-0.123
Owns own home	-0.324	0.115	-0.053	-2.82	0.005	-0.549	-0.098
Regular exercise	-0.281	0.103	-0.051	-2.73	0.006	-0.483	-0.079
Has government medical insurance	-0.302	0.145	-0.039	-2.09	0.037	-0.586	-0.018
Age (continuous)	-0.018	0.009	-0.038	-2.08	0.038	-0.035	-0.001

Table 4. Multiple linear regression of the four subscale scores from the MUNSH scale of 2242 elderly persons in Xi Cheng District, Beijing (independent variables sorted in order of importance)^a (cont'd)

Variable	β	S.E of β	standardized Beta	t	p	95% CI of β	
POSITIVE EXPERIENCE SUBSCALE^d							
SDS total score (continuous)	-0.103	0.008	-0.284	-12.27	<0.001	-0.119	-0.086
SSRS total score (continuous)	0.089	0.011	0.168	8.38	<0.001	0.068	0.110
SAS total score (continuous)	-0.063	0.010	-0.143	-6.27	<0.001	-0.083	-0.043
Poorly adjusted to retirement (3 levels)	-0.527	0.118	-0.085	-4.46	<0.001	-0.758	-0.295
Poor family relationships (3 levels)	-0.619	0.176	-0.065	-3.52	<0.001	-0.964	-0.274
Currently married	-0.458	0.198	-0.044	-2.31	0.021	-0.846	-0.069
Regular exercise	0.341	0.154	0.040	2.21	0.027	0.039	0.644
Retired at regulation age	0.342	0.172	0.036	1.99	0.047	0.005	0.679
NEGATIVE EXPERIENCE SUBSCALE^e							
SDS total score (continuous)	0.098	0.007	0.316	13.65	<0.001	0.084	0.112
SAS total score (continuous)	0.055	0.009	0.146	6.43	<0.001	0.038	0.072
Educational level (8 levels)	-0.323	0.067	-0.098	-4.83	<0.001	-0.455	-0.192
Regular exercise	-0.607	0.133	-0.084	-4.58	<0.001	-0.868	-0.347
Poor family relationships (3 levels)	0.540	0.150	0.067	3.60	<0.001	0.246	0.835
SSRS total score (continuous)	-0.032	0.009	-0.071	-3.52	<0.001	-0.050	-0.014
Owns own home	-0.429	0.148	-0.053	-2.89	0.004	-0.719	-0.138
Parents and children family household	-0.298	0.110	-0.050	-2.72	0.007	-0.513	-0.083
Has government medical insurance	-0.491	0.187	-0.049	-2.63	0.009	-0.857	-0.125
Level of extroversion (3 levels)	0.165	0.074	0.042	2.24	0.025	0.021	0.310
MMUNSH, Memorial University of Newfoundland Scale of Happiness; S.E., standard error; CI, confidence interval; SSRS, Social Support Rating Scale; SAS, Self-rating Anxiety Scale; SDS, Self-rating Depression Scale ^a See Statistical methods section for description of the analytic methods. Only statistically significant variables are listed. ^b Adjusted R ² for model=0.160; ^c Adjusted R ² for model=0.254; ^d Adjusted R ² for model=0.274; ^e Adjusted R ² for model=0.273							

4. Discussion

4.1 Main findings

This cross-sectional study in a representative sample of 2342 elderly residents from Xi Cheng District in Beijing found that both psychological and social factors are closely associated with subjective well-being as assessed by the Memorial University of Newfoundland Scale of Happiness (MUNSH). Only a minority of respondents (8.6%) reported high levels of depression, but the level of depressive symptoms was, nevertheless, the factor most strongly associated with subjective well-being. Similarly, an even smaller proportion of respondents (5.3%) reported high levels of anxiety, but the level of anxiety was also strongly associated with subjective well-being. The other factors that were most consistently associated with overall well-being and the four components of well-being assessed by the MUNSH (Positive Attitude, Negative Attitude, Positive Experience, and Negative Experience) were social support, self-reports of the quality of family relationships, and regular exercise.

Other factors associated with overall subjective well-being (but not necessarily with the four components of well-being) include personal income, self-report of ability to regulate mood, retirement at the government-specified age, and the number of regular leisure activities. Somewhat surprisingly, after adjustment for the other factors, gender, age, marital status and level of education were not significantly related to subjective well-being.

Our findings are broadly consistent with previous studies from other countries^[8-11] which find that elderly community members' level of happiness is related to their mental health, relationships with relatives, income, physical activity level, and leisure activities, but not related to gender or marital status. Our findings also confirm those of other studies in China that report that subjective well-being is related to psychological health,^[12] income level,^[13,14] social support (particularly from family members),^[15-17] physical activity,^[18] and leisure activities.^[19] However, our study did not confirm a previous study from China^[13] which found that widows and widowers had much poorer subjective well-being.

Given the importance of government-mandated retirement in China, we developed three variables to assess the role of retirement on subjective well-being: respondents' attitude about the government-mandated retirement age, respondent's actual retirement age (at the government-mandated age or not), and respondents' self-reported adjustment to retirement. Retiring at the mandated age was independently related to overall happiness score and to the Positive Experience subscale score but neither of the other two variables was independently related to any of the happiness measures. Self-reported adjustment to retirement was related to subjective well-being in the univariate analysis but it no longer remained significant after adjustment for other variables in the multivariate analyses. Further work will be needed to develop more sensitive measures of the effect of retirement on elderly individuals.

The four subscales of the MUNSH were moderately to highly correlated (absolute values of r_s ranged 0.29 to 0.60). The univariate analysis found several differences in the variables associated with each of the four subscales, but the multivariate analysis found that depressive and anxiety symptoms were independent predictors of all four subscales scores and that social support, self-report of family functioning, and participating in regular exercise were predictors of three of the four subscale scores. Each subscale also had some unique predictors in the multivariate models, but the overall impression is that the association networks of the four subscales are more similar than different. Further work, preferably in prospective studies, will be needed to reassess the independence of the constructs assessed by the subscales and to determine whether there is 'added value' to separating the total happiness score into the four component scores.

4.2 Limitations

There are several issues that need to be considered when interpreting these results. a) Xi Cheng District is one of the most economically developed of the 14 districts and 2 counties in the Beijing Municipality so, despite being quite representative of the Xi Cheng District, the results may not apply to other parts of Beijing or to other parts of urban China. b) Personal income, particularly for retirees, does not necessarily reflect the living standard of the individual, which may be more directly influenced by overall family income (including support from children). In the future it would be helpful to measure per capita family income and use that as the proxy for the living standard of the individual. c) Several of the key variables assessed in this study (including respondents' attitude to retirement, self-report of the quality of family relationships, temperament, regulation of mood and so forth) are obtained from a questionnaire developed by the authors that is of unknown reliability and validity. The ability of this instrument to reliably assess these phenomena needs to be formally assessed.

d) The exclusion of 100 respondents – most of whom were in fulltime employment at the time of the survey – from the multivariate analyses may have biased the results. e) The study relies on the validity of the MUNSH in this elderly urban sample but the previous assessment of the reliability and validity of this scale in China was more than a decade ago and involved a different type of respondent. It will be important to reassess this scale's reliability and validity in elderly urban residents before using it to monitor changes in well-being before and after specific community interventions. f) Finally, this is a cross-sectional study so the relationships identified between subjective well-being and the other variables are only associations; no inferences can be made about the causal direction of these associations.

4.3 Significance

Increasing life-expectancy and the one-child-per-family policy in urban China have resulted in an accelerated rate of aging of the urban population. This sudden graying of urban China combined with a relatively young government-mandated urban retirement age (50 to 55 in females and 60 in males) is resulting in an unexpectedly rapid increase in the numbers of idle elderly. Ensuring the quality of life and well-being of this rapidly expanding segment of the population has become a major focus of the government's social welfare programs. But given the complexity of the factors involved and the ever-changing environment in which these factors operate, designing evidence-based interventions to achieve this goal is a major scientific challenge.

The close association between well-being and psychological symptoms of depression and anxiety found in this study suggest that directly treating depression and anxiety would be an appropriate target for programs aimed at improving the quality of life and well-being of the elderly. But only a small minority of respondents had depressive or anxiety symptoms that were severe enough to merit clinical intervention, so this type of intervention would not benefit most community members. Moreover, given the cross-sectional nature of the study, it is possible that the depressive and anxiety symptoms were the result (not the cause) of a low quality of life or of underlying social problems, so treating the psychological symptoms may not address the main problems. Other potential targets for intervention suggested by the study include the expansion of social support networks, reducing intra-family stresses, improving emotional self-regulation, encouraging regular exercise and expanding the range of leisure activities.

However, the development and testing of specific interventions aimed at improving the well-being of elderly urban residents must wait until well-designed prospective studies clarify the complex causal pathways

that interconnect the many psychosocial variables related to quality of life.

Conflict of interest

The authors report no conflict of interest related to this study.

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• 论著 •

北京市西城区老人的主观幸福度

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摘要

背景 2010年北京市政府颁布了一项旨在提高老年居民生活质量和主观幸福度的政策, 其中包括了关注精神卫生的内容。

目的 在北京市西城区老年居民样本中确定与主观幸福度有关的因素。

方法 通过随机分层整群抽样, 在北京市西城区2342名60~80岁的老年居民中进行了自评式横断面调查。采用中文版纽芬兰纪念大学幸福度量表(Memorial University of Newfoundland Scale of Happiness, MUNSH)评定幸福度。采用自编问卷收集样本人群详细的社会经济学资料。采用中文版社会支持评定量表(Social Support Rating Scale, SSRS)、焦虑自评量表(Self-Rating Anxiety Scale, SAS)和抑郁自评量表(Self-Rating Depression Scale, SDS)评定样本人群的社会支持、焦虑和抑郁。

结果 在2342名参加研究的老年人中, 1616人(69%)的幸福度总分 ≥ 32 分, 提示幸福程度较高; 423人(18.1%)的SSRS总分 ≤ 32 分, 提示获得的社会支持较少; 201人(8.6%)的SDS总分 ≥ 53 , 提示有明显抑郁; 126人(5.3%)的SAS总分 ≥ 50 , 提示有明显焦虑。多元回归分析发现自我报告的抑郁程度是与幸福度相关的最重要的因素。焦虑、社会支持、收入水平、家庭关系的质量、自我调节情绪的能力和定期锻炼也与幸福度显著相关; 但性别、婚姻状况、年龄和受教育程度与幸福度无关。

结论 在北京的老年城市居民中, 自我报告的主观幸福度低与抑郁和焦虑症状有关, 也与社会支持、收入水平和家庭关系等社会因素有关。需要进行前瞻性研究以确定这些变量之间的因果关系, 并在此基础上制订针对性的干预措施, 来提高社区老年人的生活质量和幸福度。