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Patterns and Predictors of Preparation for Future Care Among Older Rural Chinese Adults: A Latent Profile Analysis

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Abstract

This study aimed to identify profiles of preparation for future care (PFC) among older rural Chinese adults. A total of 481 older adults were recruited. PFC was evaluated using *Preparation for Future Care Needs* and respondents' social services knowledge. Information on individual characteristics, physical health indicators, mental health, and support system was collected. Four profiles of PFC were identified: scarce-preparation (22.42%), high-avoidance/low-action (26.91%), moderate-preparation (44.17%), and high-avoidance/high-action (6.50%). The scarce-preparation and high-avoidance/low-action profiles had the lowest levels of social services knowledge. Multinomial logistic regression showed that older adults in moderate-preparation and high-avoidance/high-action profiles had fewer illnesses, exercised more frequently, and had higher loneliness levels compared with those in the scarce-preparation profile. Compared with high-avoidance/low-action persons, high-avoidance/high-action persons had fewer illnesses, exercised more frequently, and had lower self-esteem and higher loneliness levels. People who performed poorly in physical health indicators and well in mental health need to increase PFC.

Keywords

advance care planning, rural, health promotion, person-centered care, latent profile analysis

Introduction

China is experiencing a rapidly aging population. In 2019, it was estimated that the percentage of the population aged 65 years and above was 11.5% of the total Chinese population, and this was expected to increase to 26.1% by 2050 (UN, 2019). Older adults develop various physical and cognitive disabilities, with a rate of 7.0% of disability in people aged 60 years and older, and a higher rate in advanced ages (Li et al., 2016). Disability limits older adults' ability to live independently. Before they develop disability and experience an increase in their care needs, a full preparation for future care (PFC), such as choosing care services or responsible care providers, could help the older adults to proactively cope with possible care difficulties. PFC for older adults is especially significant in Chinese families due to insufficient care from adult children caused by the one-child policy, and limited affordable and accessible public care support and services in China (Song et al., 2016). Anticipating future care needs and promoting PFC in older adults have been gradual and ongoing tasks (Lynn, 2005).

PFC is a form of health-promoting behavior that assists in coping with potential aging-related stressors and enhances the quality of life in older adults (Sörensen & Pinquart, 2000a, 2001). Sörensen and Pinquart developed a PFC model and suggested five steps for care planning: awareness of future care needs, gathering information, making decisions, concrete planning, and avoidance (Sörensen & Pinquart, 2001). The first step is becoming aware of vulnerabilities, potential care needs, and sources of assistance, followed by the pursuit of information from various sources. After considering the feasibility of different programs, older adults will make decisions on PFC, and as a result, concrete plans will be developed. Throughout the PFC process, gathering of information, decision-making, and concrete planning can be considered as the "action" steps. An avoidant attitude among individuals was also included as one aspect of the process, and was defined as "specifically avoiding thoughts about future care and frailty" (Sörensen et al., 2017). The PFC

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model was developed based on theories of planning in everyday situations (Scholnick & Friedman, 1993) and the proactive coping paradigm (Aspinwall & Taylor, 1997), proposing that care planning could buffer gradual deterioration and negative stressors involved in the aging process. Growing empirical studies also suggested that older adults who had prepared for future care showed less concern about the uncertainty of the future (Sörensen & Pinquart, 2000b) and had greater life satisfaction (Prenda & Lachman, 2001), while failure to engage in future care planning was related to poor mental health in older adults (Sörensen et al., 2012).

The PFC model emphasizes that multiple steps are involved in the process of future care planning. However, previous studies mainly focused on a single PFC dimension or additive contributions of an independent dimension using variable-centered approaches. For example, older adults identified as avoiders of future care planning showed higher levels of worry and symptoms of depression, and those who were aware of future risks but failed to plan reported lower levels of psychological wellbeing (Pinquart & Sörensen, 2002b). Optimistic people were found to be better at concrete planning (Sörensen et al., 2014). The traditional variable-centered approaches ignore the integrity of the PFC process and the heterogeneity of a sample. The latent profile analysis (LPA), a person-centered approach, makes it possible to distinguish different groups of individuals within a heterogeneous sample (Berlin et al., 2014). Individuals within each profile share attributes in the PFC process and differ from persons in other profiles. An additional advantage over variable-centered approach is that LPA makes it possible to identify profiles that can be prioritized in designing interventions and making policies. Thus, one of our primary objectives in this study was to explore person-centered profiles of PFC among older rural Chinese adults using LPA.

The framework for investigating PFC considers it a cognitive process. Rogers's revised protection motivation theory (PMT; Rogers, 1983) helps explain how the PFC process evolves from awareness of future needs to concrete planning (Sörensen et al., 2017). As suggested by the threat and coping appraisal components of the PMT, individuals' estimation of disability (severity and likelihood, *threat appraisal*) and the ability to fight against it (effectiveness and self-efficacy, *coping appraisal*) play important roles in activating and guiding their PFC process. One of the greatest threats for older adults is functional dependence (Brandao et al., 2018), which is represented by both physical and psychological dependence. In a study to find factors related to preference for care settings, it was suggested that self-rated health is a significant factor for older adults in choosing long-term care settings (Hajek et al., 2017). Deficits in activities of daily living and the burden of illness were also important predictors for care needs (Sörensen & Pinquart, 2001). While investigating health care among older adults, it was strongly recommended to include psychological factors such as loneliness and self-esteem (Bock et al., 2018). Furthermore, potential negative associations between informal caregiving mode and self-esteem (Hajek & Konig, 2018), as well as anxiety, depression, and PFC (Sörensen et al., 2012), were also reported. From the perspectives of coping appraisal, external support was the main source of support against the threat of disability for older adults. For example, instrumental support could promote individuals' awareness of care needs (Song et al., 2018). Preferences for care settings were significantly associated with private health insurance, living status, number of children, and other forms of external support (Hajek et al., 2017). Therefore, in this study, we collected data related to estimation of the threat of disability (represented as physical and mental health indicators) and coping ability (represented as support system) to further explore the differences and predictors of PFC among different profiles.

To sum up, this study aimed to identify different profiles of PFC based on the whole PFC process in older rural Chinese adults using LPA, and to explore the differences and predictors of PFC among different profiles according to threat and coping appraisal factors. This will assist in intuitively conducting PFC distribution among older rural Chinese adults, and be beneficial in enhancing their care needs and care planning.

Method

Participants and Procedure

This was a cross-sectional study conducted in rural communities in Shandong Province, China. According to the sixth national census in China, the number of older adults with disabilities in Shandong Province reached 37,514, ranking third nationwide (Yuejun Jing & Li, 2017). In the current study, data were collected in 2018. Four communities were selected in terms of convenience and practicalities, and all older adults who meet the inclusion criteria were recruited. The inclusion criteria included the following: (a) aged 60 years and above; (b) had physical and mental abilities to participate in interviews; (c) be willing to participate in the study; and (d) signed informed consent forms. Older adults with serious physical illnesses (such as acute stage of any disease, severe hearing impairment, and end-stage cancer) or mental disorders (such as schizophrenia and manic-depressive psychosis) were excluded. Household surveys were conducted by trained research assistants. The participants completed the questionnaires by themselves, or trained research assistants would read to participants who were illiterate. Every household survey was conducted in the presence of a supervisor. This study was approved by the Ethics Committee in School of Nursing, Shandong University (no. 2017-R-105).

Measures

Preparation for future care. The short form of the Preparation for Future Care Needs (PFCN) measure (Sörensen et al., 2017; Sörensen & Pinquart, 2001) was used in this study; it is consistent with the care preparation process drawn from

cognitive planning theory. The PFCN short form has 15 items and five dimensions, namely, awareness of future care needs (AW), avoidance (AV), gathering information (GA), making decisions (MD), and concrete planning (CP). Each dimension consists of three items. The 15-item PFCN has been validated in large samples of older adults, and has indicated good internal consistency (Cronbach's $\alpha = .72–.82$). In the current sample, Cronbach's alpha was .661 for AW, .767 for AV, .816 for GA, .817 for MD, and .854 for CP. Items are rated on a 5-point Likert-type scale, with a possible range of scores from 3 to 15 for each dimension.

Furthermore, in the current sample, we evaluated older adults' knowledge of social services as a general situation of PFC to enrich the understanding of care planning. This was assessed using five items: Item 1, "I know about the services provided by the government for older people very well, such as health insurance, social services . . ."; Item 2, "I know how to access a nursing home"; Item 3, "I know how to pay for a nursing home"; Item 4, "I know various ways to get health care"; Item 5, "I know the health services and pension agencies nearby." Each item was rated on a 5-point scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *not sure*, 4 = *agree*, and 5 = *strongly agree*. The total score of the five items ranged from 5 to 25, and was used to evaluate actual social services knowledge among older adults. Cronbach's alpha of the five social service items was .898.

Predictors

Individual characteristics. Age, gender (male/female), and education levels (illiterate, primary school, junior high school, senior high school, college and above) were collected as individual characteristics.

Physical health indicators. In this study, physical health indicators among older adults included the number of chronic illnesses, body mass index, and lifestyle (smoking, drinking, and exercise). The physical health indicators were self-reported by the older adults.

Mental health indicators. Validated scales were used to evaluate mental health among older adults, including self-esteem, loneliness, depression, and anxiety. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), which is a 10-item measure using a 4-point Likert-type scale, was used to assess self-esteem among individuals. According to Tian (2006), only Items 3, 5, 9, and 10 need reverse scoring in Chinese samples. Higher scores indicated higher self-esteem. In the current sample, Cronbach's alpha of the RSES was .830. Loneliness was assessed using the UCLA Loneliness Scale (ULS; Russell, 1996). In this study, this 20-item scale had a Cronbach's alpha value of .731. When summing the item scores, Items 1, 5, 6, 9, 10, 15, 16, 19, and 20 are reverse scored. Higher scores indicate stronger feelings of social isolation and loneliness. Symptoms of depression were assessed using the Patient Health Questionnaire–9 (PHQ-9; Kroenke et al., 2001). The PHQ-9 has been widely used in depression screening, and indicated a good Cronbach's alpha value (.867) in the current sample. It consists of nine items with higher scores indicating more serious symptoms of depression. The Generalized Anxiety Disorder–7 (GAD-7; Spitzer et al., 2006) was used to assess symptoms of anxiety among the participants. It consists of seven items, and Cronbach's alpha value in this study was .897. Higher GAD-7 scores indicate severe symptoms of anxiety.

Support system. Deeply influenced by Confucianism, family support is the core of social networks among older adults. To assess family support, we collected data on marital status (married, unmarried, widowed, and divorced), living status (living alone, living with spouse only, and living with other family members), and number of children. Furthermore, data on medical insurance and personal monthly income were collected to assess the respondents' financial security.

Statistical Analysis

IBM SPSS 22.0 and Mplus 7.0 were used to analyze the data. Mean and standard deviation were reported to describe continuous variables, while frequency and percentage were used to describe categorical variables. The five dimensions of PFCN were used to estimate patterns. Participants who were missing over two items on the 15-item PFCN were removed from the analysis, while those who were missing two or less items were included and the missingness was imputed using the mean of each dimension. We ran the LPA using Mplus to identify person-centered patterns of PFC. Model goodness-of-fit indices including the Akaike information criterion (AIC), Bayesian information criterion (BIC), sample-size-adjusted BIC (adjusted BIC), entropy, Vuong–Lo–Mendell–Rubin likelihood ratio test (VLMR), and Lo–Mendell–Rubin adjusted likelihood ratio test (LMR) were used to determine the most adequate number of profiles. Differences between the profiles related to individual characteristics, physical health indicators, mental health indicators, support system, social services knowledge, and dimensions of PFCN were evaluated using chi-square test and one-way analysis of variance (ANOVA). The least significant difference (LSD) *t*-test was used to compare differences between every pair of profiles in post hoc analyses. A multinomial logistic regression, in which significant variables relating to latent profiles recognized in univariate analysis were entered, was conducted. Individuals with missing data in predictor variables were excluded from the multinomial logistic regression. All statistical tests were set as two-tailed alpha = .05.

Results

Sample Characteristics

A total of 481 older adults were recruited to participate in the study; however, 35 individuals were excluded for missing over two items on the PFCN. Thus, the final population for

Table 1. Fit Indices for Various Profile Models of Preparation for Future Care.

Number of profiles	AIC	BIC	Adjusted BIC	Entropy	VLMR	LMR
Two profiles	10,596.779	10,662.384	10,611.607	0.845	<0.001	<0.001
Three profiles	10,315.799	10,406.006	10,336.187	0.913	<0.001	<0.001
Four profiles	10,251.477	10,366.286	10,277.426	0.847	0.0217	0.0238
Five profiles	10,170.042	10,309.453	10,201.551	0.844	0.2234	0.2281

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; Adjusted BIC = sample-size-adjusted BIC; VLMR = Vuong–Lo–Mendell–Rubin likelihood ratio test; LMR = Lo–Mendell–Rubin adjusted likelihood ratio test.

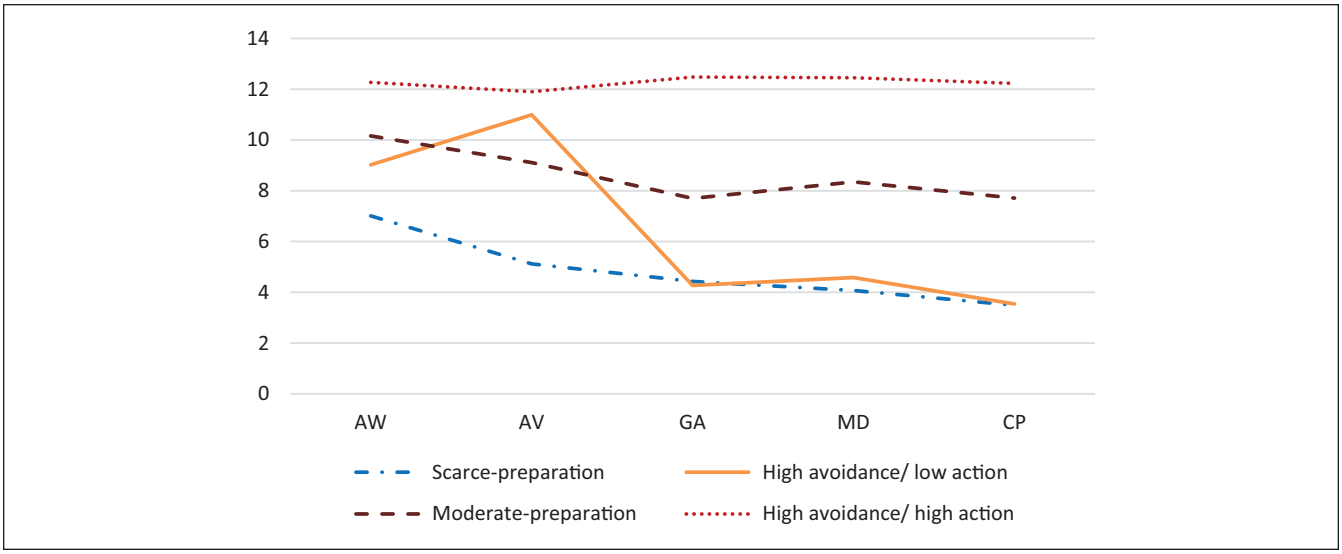

Figure 1. Four profiles of preparation for future care.
Note. AW = awareness; AV= avoidance of care planning; GA = gathering information; MD = making decision; CP = concrete planning.

LPA consisted of 446 older persons, with a *M* (*SD*) age of 70.9 (7.34) years. Of these, 77.3% were married and 15.1% lived alone. Nearly half of them (48.8%) did not receive any education, and 28.5% completed primary school education. A total of 281/481 (64.9%) older persons lived with illnesses, and the *M* (*SD*) number of illnesses was 1.5 (0.95).

Four Profiles of PFC

The LPA with the five PFCN dimensions identified four subpopulations in the sample. Table 1 presents the information criteria of the model for various profile solutions. Even though the three-profile solution showed the highest entropy (0.913), the VLMR and LMR indicated that the four-profile solution was superior to the three-profile one ($p = .0217$, $p = .0238$, respectively). The four-profile solution also performed better in terms of AIC, BIC, and sample-size-adjusted BIC compared with the three-profile one. The four PFC profiles are displayed in Figure 1. The mean scores of the five dimensions across the four profiles are presented in Table 2, and the comparisons of predictors are presented in Table 3. With reference to Tein et al. (2013), the mean distance of the variables between classes in the present study is 2.319 > 1.5, suggesting that the information criteria and sample size used herein were powerful in selecting the correct number of classes.

Older persons in Profile 1 ("scarce-preparation") lacked PFC. They showed the lowest AW, and the lowest levels of GA, MD, and CP (see Table 2). However, they also showed the lowest levels of AV. These older adults had the lowest level of knowledge about social services. The *scarce-preparation* respondents were relatively frail in terms of physical health as they had more illnesses and exercised less. However, they had lower levels of loneliness. The results are listed in Table 3.

Profile 2 ("high-avoidance/low-action") featured the high level of AV and the low levels of GA, MD, and CP. These three dimensions, GA, MD, and CP, can be recognized as "action," an execution step in the PFC process. Older people in this profile had the lowest level of knowledge of social services, like *scarce-preparation* respondents; however, they had slightly higher levels of AW and much higher levels of AV. These respondents had more illnesses, exercised less, and had lower levels of loneliness like *scarce-preparation* respondents; however, they scored highest in self-esteem. Furthermore, people in this profile were more likely to be

Table 2. Scores on the Five Dimensions of PFCN and Social Services Knowledge Across Four Profiles.

PFC dimensions	Total	Profile 1 *Scarce-preparation*	Profile 2 *High-avoidance/low-action*	Profile 3 *Moderate-preparation*	Profile 4 *High-avoidance/high-action*	*F*	Post hoc analysis
n (%)		100 (22.42%)	120 (26.91%)	197 (44.17%)	29 (6.50%)		
AW	9.28 ± 2.898	7.01 ± 2.901	9.02 ± 2.661	10.16 ± 2.227	12.27 ± 2.344	49.215**	4 > 3 > 2 > 1
AV	8.90 ± 3.037	5.12 ± 1.678	10.99 ± 1.972	9.11 ± 2.137	11.90 ± 2.956	174.164**	(4, 2) > 3 > 1
GA	6.35 ± 2.899	4.43 ± 1.621	4.27 ± 1.628	7.70 ± 1.939	12.48 ± 1.807	244.299**	4 > 3 > (1, 2)
MD	6.64 ± 3.040	4.07 ± 1.635	4.58 ± 1.679	8.35 ± 1.909	12.45 ± 1.682	287.747**	4 > 3 > (2, 1)
CP	5.94 ± 3.022	3.49 ± 1.010	3.54 ± 0.962	7.71 ± 1.882	12.23 ± 1.850	450.815**	4 > 3 > (2, 1)
Social services knowledge	12.82 ± 5.541	10.27 ± 5.404	10.57 ± 5.105	14.92 ± 4.447	17.19 ± 6.530	34.928**	4 > 3 > (2, 1)

Note. AW = awareness of future care needs; AV= avoidance of care planning; GA = gathering information; MD = making decision; CP = concrete planning.
**$p < .01$.

married and live with their families, indicating a good support system. Tables 2 and 3 display the above results.

Profile 3 ("moderate-preparation") was the most common among respondents, and showed intermediate levels of both AV and AW, as well as GA, MD, and CP. Likewise, older persons in this profile reported moderate social services knowledge (see Table 2). Their physical health was slightly better compared with that of those in the *scarce-preparation* profile because they had fewer illnesses and exercised more. However, they had high levels of loneliness (see Table 3).

In Profile 4 ("high-avoidance/high-action"), older adults showed the highest level of action (GA, MD, and CP), even though they also showed the highest levels of AV. In addition, respondents in this profile had the highest levels of social service knowledge. However, it is worth noting that this profile applied to only 6.5% (29/446) of the sample, which was barely one in five high-avoidance people (29/149). Older persons in this profile showed the best physical health indicators and worst mental health indicators in the sample. They had the least number of illnesses and the highest level of exercise, while they showed the highest loneliness and lowest self-esteem levels. Furthermore, this profile had the highest rates of people who were not married and those who were living alone, revealing their poor support system. Comparisons between pairs are listed in Table 3.

Predictors of PFC Profiles

To evaluate predictors of different PFC profiles, multinomial logistic regression analyses were conducted (Table 4). The *scarce-preparation* and *high-avoidance/low-action* profiles differed in terms of AW and AV, but not in the action dimensions. However, no predictors were identified in the multinomial logistic regression of these two profiles. The *scarce-preparation, moderate-preparation*, and *high-avoidance/high-action* profiles differed in every dimension of the PFCN. Compared with the *scarce-preparation* profile, people who had fewer illnesses, exercised more, and experienced higher levels of loneliness were more likely to belong to *moderate-preparation* and *high-avoidance/high-action* profiles. Older persons with lower self-esteem, and those who were unmarried, were also more likely to belong to the *high-avoidance/high-action* profile, rather than the *moderate-preparation* profile. Respondents in the *high-avoidance/low-action* and *high-avoidance/high-action* profiles both showed high levels of care planning avoidance; however, their levels of action differed in the PFC process. Regression analyses showed that fewer illnesses, more frequent exercise, lower self-esteem, and higher loneliness levels were associated with a higher action level in the PFC, which implies an increased likelihood of having a *high-avoidance/high-action* profile compared with *the high-avoidance/low-action* profile.

Discussion

This study explored the patterns of PFC by including the whole PFC process using LPA. This approach has the advantage of considering PFC as a system, allowing individual differences to emerge in the PFC subgroups. To the best of our knowledge, this is the first study to apply LPA to explain the PFC process among older rural Chinese adults. Four profiles of PFC were identified, namely *scarce-preparation, high-avoidance/low-action, moderate-preparation*, and *high-avoidance/high-action*. Furthermore, better physical health performance (e.g., fewer illnesses and more frequent exercise) and worse mental health conditions (e.g., lower self-esteem and higher loneliness) were found to be associated with high-action profiles.

Among the four PFC profiles, even though the profile with the highest number of older adults is the *moderate-preparation* profile, with 44.17% of respondents, the care planning status in the whole sample was rather negative. Because nearly a quarter of older adults were not ready for PFC (*scarce-preparation profile*: 22.42%), and one-third of them refused to consider aging-related crises (people showed high

Table 3. Characteristics of Preparation for Future Care Across Subgroups.

Predictors	Total	Pattern 1	Pattern 2	Pattern 3	Pattern 4	F/χ^2	p	Post hoc analysis
Individual characteristics								
Age (years)	70.85 ± 7.338	72.43 ± 7.840	70.63 ± 7.029	70.14 ± 8.257	71.21 ± 6.858	2.235	0.083	1 > 3
Gender						2.766	0.429	
Male	213 (48.0%)	49 (49.5%)	50 (41.7%)	99 (50.3%)	15 (53.6%)			
Female	231 (52.0%)	50 (50.5%)	70 (58.3%)	98 (49.7%)	13 (46.4%)			
Education						3.813	0.282	
Illiteracy	215 (48.8%)	56 (56.6%)	58 (49.2%)	89 (45.6%)	12 (41.4%)			
Literacy	226 (51.2%)	43 (43.4%)	60 (50.8%)	106(54.4%)	17 (58.6%)			
Physical health								
Body mass index	23.19 ± 3.354	23.06 ± 3.567	23.52 ± 3.399	23.20 ± 3.149	22.29 ± 3.730	1.093	0.352	—
No. of illness	1.51 ± 0.952	1.72 ± 1.178	1.57 ± 0.879	1.41 ± 0.898	1.21 ± 0.568	3.415	0.017	1 > (3, 4)
Illness						19.194	<0.001	
Yes	281 (64.9%)	70 (74.5%)	86 (72.3%)	115 (59.9%)	10 (35.7%)			
No	152 (35.1%)	24 (25.5%)	33 (27.7%)	77 (40.1%)	18 (64.3%)			
Smoking						1.668	0.644	
Yes	76 (17.1%)	14 (14.1%)	24 (20.0%)	32 (16.3%)	6 (20.7%)			
No	368 (82.9%)	85 (85.9%)	96 (80.0%)	164 (83.7%)	23 (79.3%)			
Drinking						2.488	0.478	
Yes	105 (23.7%)	23 (23.2%)	23 (19.3%)	50 (25.5%)	9 (31.0%)			
No	338 (76.3%)	76 (76.8%)	96 (80.7%)	146 (74.5%)	20 (69.0%)			
Exercise						27.010	<0.001	
Usually	165 (37.3%)	33 (33.7%)	43 (35.8%)	77 (39.5%)	12 (41.4%)			
Sometimes	162 (36.7%)	25 (25.5%)	39 (32.5%)	83 (42.6%)	15 (51.7%)			
Seldom	115 (26.0%)	40 (40.8%)	38 (31.7%)	35 (17.9%)	2 (6.9%)			
Mental health								
RSES	31.63 ± 4.501	31.48 ± 4.585	32.84 ± 4.455	31.27 ± 4.374	29.27 ± 4.374	5.381	0.001	2 > (1, 3); 2 > 4
ULS	49.97 ± 7.857	47.75 ± 7.155	48.46 ± 5.952	51.62 ± 7.004	52.83 ± 15.825	8.722	<0.001	(4, 3) > (2, 1)
PHQ-9	13.44 ± 4.722	13.88 ± 4.993	13.50 ± 4.029	13.15 ± 4.714	13.68 ± 6.418	0.559	0.642	—
GAD-7	10.00 ± 3.573	10.19 ± 3.203	9.98 ± 3.423	9.88 ± 3.661	10.29 ± 4.783	0.232	0.874	—
Support system								
Marital status						11.128	0.011	
Married	344 (77.3%)	69 (69.0%)	100 (83.3%)	157 (80.1%)	18 (62.1%)			
Not married	101 (22.7%)	31 (31.0%)	20(16.7%)	39 (19.9%)	11 (37.9%)			
Living status						14.760	0.022	
Alone	67 (15.1%)	19 (19.4%)	10 (8.3%)	31 (15.7%)	7 (25.0%)			
With spouse only	267 (60.3%)	47 (48.0%)	81 (67.5%)	125 (63.5%)	14 (50.0%)			
With other family members	109 (24.6%)	32 (32.6%)	29 (24.2%)	41 (20.8%)	7 (25.0%)			
No. of children	2.39 ± 1.130	2.59 ± 1.267	2.43 ± 1.006	2.32 ± 1.126	1.96 ± 1.076	2.530	0.057	1 > 4
Medical insurance						0.406	0.939	
Yes	419 (95.9%)	93 (94.9%)	113 (96.6%)	186 (95.9%)	27 (96.4%)			
No	18 (4.1%)	5 (5.1%)	4 (3.4%)	8 (4.1%)	1 (3.6%)			
Monthly income						6.231	0.398	
≤500	234 (66.1%)	61 (76.3%)	68 (64.8%)	97 (63.0%)	8 (53.3%)			
501–1,000	77 (21.8%)	13 (16.2%)	25 (23.8%)	35 (22.7%)	4 (26.7%)			
>1,000	43 (12.1%)	6 (7.5%)	12 (11.4%)	22 (14.3%)	3 (20.0%)			

Note. Pattern 1 = Scarce-preparation, Pattern 2 = High-avoidance/low-action, Pattern 3 = Moderate-preparation, Pattern 4 = High-avoidance/high-action; values are given as mean ± standard deviation or *n* (%). RSES = Rosenberg Self-esteem Scale; ULS = UCLA Loneliness Scale; PHQ-9 = Patient Health Questionnaire–9; GAD-7 = Generalized Anxiety Disorder–7.

avoidance: 33.41%). Only a small group of respondents took actions regarding PFC (6.5%). In addition, the mean scores of GA, MD, and CP reduced to below the midpoint in each dimension (range: 3–15, midpoint: 9). In previous studies, PFC was evaluated in only two special samples in China: older parents who lost their only adult child (Chen et al., 2019) and urban Chinese baby boomers (Song et al., 2018), and few evaluated the overall situation of PFC among older rural Chinese adults. However, studies that focused on the relationship between familism and intended care arrangements provided a potential explanation for the poor PFC status in the current population (Fu & Chui, 2019; Song et al., 2016). The Chinese are strong proponents of familism. They consider the older children as the primary care providers, and more emotional support from children was negatively related to care-planning-information gathering (Song et al., 2018). This deep-rooted belief, on one hand, assigns the duty of long-term care to adult children, reducing the older people's initiative in preparing for future care by themselves (Pinquart et al., 2003; Scharlach et al., 2006); on the other hand, it limits policymakers' work in the provision of care services, fundamentally shrinking resources for long

Table 4. Multinomial Logistic Regression Across Subgroups of Preparation for Future Care.

	Reference: Scarce-preparation						Reference: High-avoidance/low-action				Reference: Moderate-preparation	
	High-avoidance/low-action		Moderate-preparation		High-avoidance/high-action		Moderate-preparation		High-avoidance/high-action		High-avoidance/high-action	
Predictors	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
No. of illnesses	0.980	[0.739, 1.299]	0.669**	[0.496, 0.902]	0.378*	[0.179, 0.798]	0.683*	[0.511, 0.912]	0.386*	[0.183, 0.812]	0.565	[0.274, 1.168]
Exercise[a]												
Sometimes	1.390	[0.703, 2.747]	2.933**	[1.490, 5.773]	9.661**	[1.839, 50.747]	2.111*	[1.126, 3.958]	6.952*	[1.341, 36.048]	3.294	[0.654, 16.591]
Usually	1.326	[0.661, 2.661]	3.433**	[1.740, 6.774]	12.586**	[2.362, 67.078]	2.589**	[1.377, 4.869]	9.492**	[1.806, 49.890]	3.666	[0.722, 8.619]
Married[b]	0.986	[0.384, 2.529]	1.277	[0.505, 3.230]	0.309	[0.069, 1.396]	1.295	[0.520, 3.221]	0.314	[0.071, 1.395]	0.242*	[0.059, 0.991]
RSES	1.060	[0.995, 1.130]	0.978	[0.919, 1.040]	0.880*	[0.791, 0.979]	0.922**	[0.870, 0.977]	0.830*	[0.747, 0.922]	0.900*	[0.815, 0.994]
ULS	1.017	[0.983, 1.052]	1.078**	[1.039, 1.119]	1.089**	[1.026, 1.157]	1.060**	[1.023, 1.099]	1.071*	[1.009, 1.137]	1.010	[0.955, 1.069]

Note. Living status was entered and showed no significance; OR = odds ratio; CI = confidence interval; RSES = Rosenberg Self-esteem Scale; ULS = UCLA Loneliness Scale.
[a]Seldom exercise as reference. [b]Not married as reference.
*$p < .05$. **$p < .01$.

term care (Taghizadeh Larsson & Osterholm, 2014). In addition, it is worth noticing that cultural, contextual, and individual factors affect PFC (Pinquart & Sörensen, 2002a). Even though the older Latinos and Mexicans share a common belief with Chinese in terms of familism (Delgadillo et al., 2004, Fuller-Iglesias & Antonucci, 2016), people in Western countries such as America, Germany, and Canada rely more on a stable health care system (Sörensen & Pinquart, 2000b). That is, PFC may vary with culture, and researchers must compare PFC in different countries in the future.

There were coordinated changes in the GA, MD, and CP dimensions in the diverse profiles. Indeed, in this study, we found that "action" was associated with actual social services knowledge among individuals, without being affected by "avoidance." Comparing *scarce-preparation* (low-avoidance and low-action) with *high-avoidance/low-action*, both profiles indicated the lowest levels of knowledge of social services even though they differed greatly in terms of "avoidance." Similarly, *high-avoidance/high-action* individuals had higher levels of knowledge of social services compared with *high-avoidance/low-action* individuals, which is consistent with the "action" level rather than the "avoidance" level. This finding is slightly beyond expectation; however, it may be explained by the cognitive planning theories where the PFC process was drawn, in which "avoidance" implies that individuals sometimes strategically avoid stressors (Aspinwall, 2012). Thus, "avoidance" cannot always be considered a negative coping style (Mak & Sörensen, 2012). Some findings indicated that avoidance of future care needs may have short-term emotional benefits (Sörensen et al., 2012). According to Pinquart & Sörensen (2002b), respondents who avoided thinking about future care needs seemed to be as satisfied as those who had made plans in advance. Above all, these address the benefits of strategic avoidance as a self-protective behavior. Previous studies tended to blame "avoidance" as the reason fewer older persons engaged in concrete care planning (Song et al., 2016); however, this seems slightly one-sided as in this study while social services knowledge was not affected by "avoidance." Our findings support the effect of "action." Gathering information helped older adults to obtain more resources, thus becoming capable of making decisions and concrete plans in terms of care arrangements to meet their needs. Pinquart and Sörensen (2002b) found that older adults who made concrete plans reported higher preparation satisfaction and lower depression (Pinquart & Sörensen, 2002b), which is consistent with the current findings. The new implication is that providing informative materials about older people care would be helpful, to some extent, without worrying about their avoidant attitude. Certainly, it is also not wise to abandon "avoidance" completely because one person's knowledge and attitude directly/indirectly affect behaviors as suggested by the Knowledge–Attitude–Behavior model (Yi & Hohashi, 2018). We inferred that there could be differences in PFC action between those who were avoidant and those who were not in terms of categories of information gathering or approaches of concrete planning, which need to be further studied in the future.

Consistent with Roger's threat and coping appraisal components of the PMT, estimations of expected disability reflected in physical and mental indicators largely affected PFC profiles. However, no significant association with PFC was found in coping appraisal represented as the support system. Even though physical and mental indicators were both related to PFC, they showed different effects. This study found that poor physical health performance was associated with poor-action preparation profiles, while poor mental health condition was correlated with better-action preparation profiles. For older adults, the probability of experiencing a poor physical condition increases with age. Existing health problems, which does not refer to expected disability but actual health problems, may require a great deal of attention and resources, and may limit people's engagement in PFC. The negative association between physical health problems and proactive coping reported by Ouwehand et al. (2009) also supported this result. As far as mental health is concerned, we found that higher levels of negative emotions, including loneliness and self-esteem, were more reported in the high-action profile (Profile 4), which is consistent with the threat appraisal component of PMT. Such negative arousal was also previously mentioned in the proactive coping process (Aspinwall, 2012). Threat from expected disability has the possibility to arouse negative thoughts and emotions, and thereafter, arouse motivation for proactive coping behaviors. Older adults with high loneliness and low self-esteem levels were highly sensitive to the threat of aging-related disabilities and were easily motivated to cope with the threat by promoting PFC. Regrettably, we did not find obvious coping appraisal effects on PFC from the perspective of PMT. The external support used in this study may not be enough to assess individuals' coping ability. Beliefs in successfully carrying out the recommended plan (self-efficacy) were also un-ignorable aspects in this regard (Cooper & McCarter, 2014).

Significantly, associations between predictors and PFC in the present cross-sectional study should not be overinterpreted. For example, older people in the *high-avoidance/high-action* profile showed good physical health indicators (a small number of chronic illnesses and high levels of exercise) but poor support systems (high rate of non-married and living-alone people). It is not wise to conclude that single people were more likely to make PFC actions, and as a result, experienced fewer illnesses from this observational data due to the small sample size in this profile (6.5% of all participants, 29/446) and the cross-sectional design. Back to this study's objective of exploring predictors of PFC, we may only find negative associations between physical health indicators and PFC without further inference.

We believe that the current study has some strengths. First, Sörensen and Pinquart conceptualized PFC as a successive process (Sörensen & Pinquart, 2000a), and we

identified different patterns based on this process. To the best of our knowledge, this is the first study to apply the LPA approach in PFC studies, which makes it possible to visualize the distribution of the PFC as a whole process but separate dimension. Second, considering the exposure to inequitable social conditions and the increased proportion of older adults experiencing empty-nest syndrome caused by young rural labor force flowing to cities (Huang et al., 2019), care planning in older rural adults deserves an intensive focus. Moreover, we examined predictors of PFC profiles in terms of physical and mental health indicators, as well as support systems based on the threat and coping appraisal model, which provided a thorough frame for the examination.

However, this study also has some limitations. First, the support system in this study was assessed using only objective indicators, which is a narrow aspect of support systems. In future studies, perceived social support should also be considered. Second, the small sample size, especially in the *high-avoidance/high-action* profile, suggests that some results need to be interpreted with caution. Furthermore, the small sample size may also limit a subgroup with low avoidance/high action. It would make sense to compare this subgroup with the *high-avoidance/high-action* subgroup. Third, the cross-sectional design makes it hard to conclude casual association. In the future, prospective longitudinal studies should be conducted to evaluate the predictive effects and follow the stability of PFC profiles.

In conclusion, to the best of our knowledge, this is the first study to apply LPA in identifying the patterns of PFC among older rural Chinese adults. Four distinct profiles, namely, *scarce-preparation, high-avoidance/low-action, moderate-preparation*, and *high-avoidance/high-action*, were identified in these older persons. Fewer illnesses, more exercise, lower self-esteem, and higher loneliness levels were associated with high-action profiles, which suggested that exercise interventions could be useful in care planning programs.

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Ethical Approval

This study has been approved by School of Nursing Ethics Committee in Shandong University (no. 2017-R-105).

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References

Aspinwall, L. G. (2012). Future-oriented thinking, proactive coping, and the management of potential threats to health and well-being. In S. Folkman (Ed.), *Oxford handbook of stress, health, and coping* (pp. 1–35). Oxford University Press.

Aspinwall, L. G., & Taylor, S. E. (1997). A stitch in time: Self-regulation and proactive coping. *Psychological Bulletin*, *121*(3), 417–436.

Berlin, K. S., Williams, N. A., & Parra, G. R. (2014). An introduction to latent variable mixture modeling (part 1): Overview and cross-sectional latent class and latent profile analyses. *Journal of Pediatric Psychology*, *39*(2), 174–187.

Bock, J. O., Hajek, A., & König, H. H. (2018). The longitudinal association between psychological factors and health care use. *Journal of Health Services Research*, *53*(2), 1065–1091.

Brandao, M. P., Martins, L., Szewczyczak, M., Talarska, D., Philp, I., & Cardoso, M. F. (2018). Threats to health and well-being perceived by older people in Poland and Portugal. *Acta Medica Portuguesa*, *31*(7–8), 409–415.

Chen, L., Song, Y., & You, Y. (2019). Life restoration and future care preparation among older parents in Shanghai who have lost their only adult child. *Journal of Applied Gerontology*, *3*(Suppl. 1), Article S275.

Cooper, J., & McCarter, K. A. (2014). The development of a community and home-based chronic care management program for older adults. *Public Health Nursing*, *31*(1), 36–43.

Delgadillo, L., Sörensen, S., & Coster, D. C. (2004). An exploratory study of preparation for future care among older Latinos in Utah. *Journal of Family and Economic Issues*, *25*(1), 51–78.

Fu, Y. Y., & Chui, E. W. T. (2019). Determinants of patterns of need for home and community-based care services among community-dwelling older people in urban China: The role of living arrangement and filial piety. *Journal of Applied Gerontology*, *39*, 712–721.

Fuller-Iglesias, H. R., & Antonucci, T. C. (2016). Familism, social network characteristics, and well-being among older adults in Mexico. *Journal of Cross-Cultural Gerontology*, *31*(1), 1–17.

Hajek, A., & Konig, H. H. (2018). Does informal caregiving affect self-esteem? Results from a population-based study of individuals aged 40 and over in Germany from 2002 to 2014. *Scandinavian Journal of Caring Sciences*, *32*(3), 1047–1055.

Hajek, A., Lehnert, T., Wegener, A., Riedel-Heller, S. G., & Koenig, H. H. (2017). Factors associated with preferences for long-term care settings in old age: Evidence from a population-based survey in Germany. *BMC Health Services Research*, *17*, Article 156.

Huang, L.-j., Du, W.-t., Liu, Y.-c., Guo, L.-n., Zhang, J.-j., Qin, M.-m., & Liu, K. (2019). Loneliness, stress, and depressive symptoms among the Chinese rural empty nest elderly: A moderated mediation analysis. *Issues in Mental Health Nursing*, *40*(1), 73–78.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*(9), 606–613.

Li, Z. Z., Tang, Z., & Wang, R. (2016). Status of elderly disability in 7 cities of China (in Chinese). *Zhonghua liu xing bing xue za zhi = Zhonghua liuxingbingxue zazhi*, *37*(12), 1561–1564.

Lynn, J. (2005). Living long in fragile health: The new demographics shape end of life care. *Hastings Center Report*, *35*(7), s14–s18.

Mak, W., & Sörensen, S. (2012). Trajectories of preparation for future care among first-degree relatives of Alzheimer's disease patients: An ancillary study of ADAPT. *Gerontologist*, *52*(4), 531–540.

Ouwehand, C., de Ridder, D. T., & Bensing, J. M. (2009). Who can afford to look to the future? The relationship between socio-economic status and proactive coping. *European Journal of Public Health*, *19*(4), 412–417.

Pinquart, M., & Sörensen, S. (2002a). Factors that promote and prevent preparation for future care needs: Perceptions of older Canadian, German, and US women. *Health Care for Women International*, *23*(6–7), 729–741.

Pinquart, M., & Sörensen, S. (2002b). Psychological outcomes of preparation for future care needs. *Journal of Applied Gerontology*, *21*(4), 452–470.

Pinquart, M., Sörensen, S., & Davey, A. (2003). National and regional differences in preparation for future care needs: A comparison of the United States and Germany. *Journal of Cross-Cultural Gerontology*, *18*(1), 53–78.

Prenda, K. M., & Lachman, M. E. (2001). Planning for the future: A life management strategy for increasing control and life satisfaction in adulthood. *Psychology and Aging*, *16*(2), 206–216.

Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In D. J. C. R. Petty (Ed.), *Social psychophysiology* (pp. 153–176). Guilford Press.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.

Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, *66*(1), 20–40.

Scharlach, A. E., Kellam, R., Ong, N., Baskin, A., Goldstein, C., & Fox, P. J. (2006). Cultural attitudes and caregiver service use: Lessons from focus groups with racially and ethnically diverse family caregivers. *Journal of Gerontological Social Work*, *47*(1–2), 133–156.

Scholnick, E. K., & Friedman, S. L. (1993). Planning in context: Developmental and situational considerations. *International Journal of Behavioral Development*, *16*(2), 145–167.

Song, Y. J., Sörensen, S., & Yan, E. C. W. (2018). Family support and preparation for future care needs among urban Chinese baby boomers. *The Journals of Gerontology Series B Psychological Sciences and Social Sciences*, *73*(6), 1066–1076.

Song, Y. J., Yan, E. C. W., & Sörensen, S. (2016). The effects of familism on intended care arrangements in the process of preparing for future care among one-child parents in urban China. *Ageing and Society*, *37*(7), 1416–1434.

Sörensen, S., Chapman, B. P., Duberstein, P. R., Pinquart, M., & Lyness, J. M. (2017). Assessing future care preparation in late life: Two short measures. *Psychological Assessment*, *29*(12), 1480–1495.

Sörensen, S., Hirsch, J. K., & Lyness, J. M. (2014). Optimism and Planning for Future Care Needs among Older Adults. *Geropsych (Bern)*, *27*(1), 5–22.

Sörensen, S., Mak, W., Chapman, B., Duberstein, P. R., & Lyness, J. M. (2012). The relationship of preparation for future care to depression and anxiety in older primary care patients at 2-year follow-up. *American Journal of Geriatric Psychiatry*, *20*(10), 887–894.

Sörensen, S., & Pinquart, M. (2000a). Preparation for future care needs by West and East German older adults. *Journals of Gerontology*, *55*(6), S357–S367.

Sörensen, S., & Pinquart, M. (2000b). Preparation for future care needs: Styles of preparation used by older Eastern German, United States, and Canadian women. *Journal of Cross-Cultural Gerontology*, *15*(4), 349–381.

Sörensen, S., & Pinquart, M. (2001). Developing a measure of older adults' preparation for future care needs. *International Journal of Aging & Human Development*, *53*(2), 137–165.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, *166*(10), 1092–1097.

Taghizadeh Larsson, A., & Osterholm, J. H. (2014). How are decisions on care services for people with dementia made and experienced? A systematic review and qualitative synthesis of recent empirical findings. *International Psychogeriatrics*, *26*(11), 1849–1862.

Tein, J. Y., Coxe, S., & Cham, H. (2013). Statistical power to detect the correct number of classes in latent profile analysis. *Structural Equation Modeling: A Multidisciplinary Journal*, *20*(4), 640–657.

Tian, L. (2006). Shortcoming and merits of Chinese version of Rosenberg (1965) Self-Esteem Scale. *Psychological Exploration*, *26*(2), 88–91. (in Chinese)

UN. (2019). *World population ageing 2019*. Department of Economic and Social Affairs, United Nations.

Yi, Q., & Hohashi, N. (2018). Comparison of perceptions of domestic elder abuse among healthcare workers based on the Knowledge-Attitude-Behavior (KAB) model. *PLOS ONE*, *13*(11), Article e0206640.

Yuejun Jing, H. L., & Li, Y. (2017). Quantitative forecast analysis of the quantity and structure of disability old in China. *Population Journal*, *39*, 81–89. (in Chinese)