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Influence of Health-promoting Lifestyle on the Living Quality of the Elderly in Guangxi, China

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Abstract: Objective: To understand the current situation of health promotion lifestyle and living quality of the elderly in Guangxi Province, China. To analyze the influencing factors of the living quality of the elderly in Guangxi, and to explore the influence of health promotion lifestyle on the quality of life. Methods: The health promotion lifestyle scale (HPLP-C) and the health status survey summary table (SF-36) were applied to investigate the elderly aged 60 and above in Guangxi. Results: The total health promotion lifestyle of the elderly in Guangxi is 94.63±13.90 points, lower than the total health promotion lifestyle studied by scholars in the past 10 years. The total quality of life is 71.91±13.04, which is lower than China's norm. After typical correlation analysis, the results showed that the typical correlation between health promotion lifestyle and quality of life reached significant levels, both with positive correlation. Conclusions: Good health promotion lifestyle standards can improve the living quality of the elderly, in which health responsibility, self-realization, interpersonal support, exercise, stress treatment, physical function (PF), role physiological (RP), bodily pain (BP), overall health (GH), vitality (VT), social function (SF), and mental health (MH) are the main determine factors affecting the relationship, and interventions can be taken to improve the living quality of the elderly in Guangxi.

Keywords: Elderly in Guangxi; Health Promotion Lifestyle; Living Quality.

1. Introduction

Aging is a natural process in the evolution of life, and population aging is an inevitable trend in the development of society to a certain stage. The aging of social population refers to the phenomenon that the proportion of aged population increases correspondingly due to the reduction of young population and the increase of the aged population in the total population caused by the reduction of population fertility and the extension of per capita life expectancy [1]. Guangxi province is already a region with a relatively serious aging population, and the increasing elderly population has become a new issue and bottleneck influencing Guangxi's economic and social development [2]. The economy of the Guangxi province is still underdeveloped, and the arrival of population aging will bring serious challenges to the social and economic development, social pension security and medical system in the Guangxi region.

In recent years, with the change in health concepts in China, the relationship between health-promoting lifestyle and quality of life has gradually become a hotspot of society. There is evidence that diseases caused by lifestyle can be better managed and controlled through health promotion behavior [3]. As an active lifestyle, a health-promoting lifestyle is a kind of behavior that leads individuals, families, communities, and society towards promoting peace, happiness and realizing health potential, that is, various positive life methods adopted by individuals to achieve the highest level of health and increase peace and happiness [4], such as Good nutrition, Health responsibility, Interpersonal support, Self-realization, Exercise behavior, and Stress management behavior. Quality of life (QOL) is a broad concept that includes psychological and physical characteristics and their degree is a comprehensive indicator to evaluate the health status of a population in both subjective and objective terms [5]. Its more generally applicable definition is based on socio-economic and cultural background, and value orientation. A sensory experience of social ability and personal overall situation [6]. In the Outline of Healthy China Initiative 2030, it is especially emphasized that the elderly group is one of the key focus in the construction of Healthy China. Focusing on the health status of the elderly group and promoting active and healthy lifestyle have become important measures to promote the development of a harmonious society [7]. The overall health status of the elderly population in China is poor, and health promotion work in accordance with the characteristics of the elderly and the differences within the group is still in its infancy [8]. Although relevant surveys on the healthy lifestyle and behavior of residents in China have been carried out, there are relatively few studies on Zhuang residents [9]. Therefore, this paper focuses on the elderly in Guangxi, for the purpose of understanding the level of health promotion lifestyle and living quality of the elderly in Guangxi, a minority area in China.

2. Objects and Methods

2.1. Survey Subjects

According to the principle of informed consent, elderly people aged 60 and above with normal hearing and clear consciousness were selected for the questionnaire survey in Guangxi. A total of 2000 questionnaires were distributed, and 1914 valid questionnaires were recovered after excluding the omitted and wrong copies, with an efficiency of 95.7%. Among them, 966 were male, accounting for 50.5%, and 948 were female, accounting for 49.55%, age (67.04±4.53).

2.2. Survey Tools

2.2.1. Health Promotion Lifestyle Scale

The Chinese version of the Health-Promoting Lifestyle Profile (HPLP-C) was applied to conduct the survey. The

scale has 40 entries with 6 dimensions [10]. The dimensions were nutrition, health responsibility, interpersonal support, self-actualization, exercise behavior, and stress management; higher scores on each dimension represented better health behavior competence, and Cronbach's α coefficient of the scale was 0.902.

2.2.2. Quality of Life Scale

The study was conducted by using the Chinese short version of the Self-awareness Health Status Questionnaire (SF-36). The scale consists of 8 dimensions with 36 entries. The dimensions were Physical Function PF with 10 entries, Role Physical RP with 4 entries, and Bodily Pain BP with 2 entries, with reverse scoring. General Health GH 5 entries, problem entries 1, 2, and 4 reverse scoring. Vitality VT 4 entries, Social Function SF 2 entries, question entry 6 reverse scoring. Role Emotional RE 3 entries, Mental Health MH 5 entries, and health transition entries. Higher scale scores indicate better quality of life status [11], and Cronbach's α coefficient for the scale was 0.791.

2.2.3. General Information Questionnaire

A general condition questionnaire was used to investigate the basic information of the candidates, such as gender, age, ethnicity, education level, exercise status, and whether they suffered from chronic diseases.

2.3. Quality Control and Statistical Methods

2.3.1. Quality Control

To ensure the accuracy of information and to carry out quality control, uniform training was provided to surveyors before the survey started. In accordance with the principle of informed consent, questionnaires were distributed and then the candidates were allowed to fill them out by themselves. Older people with literacy difficulties could be assisted to complete the questionnaire by means of communication and Q&A, and the questionnaire was collected immediately after completion.

2.3.2. Statistical Methods

The information obtained should be carefully verified to ensure completeness and accuracy. The collected information was organized using Excel and after verifying all valid data, a database was created. The data were then statistically analyzed and described again using Spss 25.0 software, with inferential statistics using a t-test, analysis of variance (rank-sum test), and typical correlation analysis, with $P < 0.05$ or 0.001 as the test for statistical differences.

3. Results

3.1. Living Quality of the Elderly in Guangxi Compared with the Chinese Norm

The differences were statistically significant ($P < 0.001$) when comparing the scores of each dimension of the living quality of the elderly in Guangxi with the Chinese normative model [12]. The results showed that most of the scores of each dimension of the living quality of elderly people in Guangxi were lower than the normative model, as detailed in Table 1.

Table 1. Comparison of the Living Quality Scores of Elderly People in Guangxi with the Chinese norm

Dimensionality	Guangxi n=1914	China Standing Model n=2249	T Value	P Value
Physical Function PF	79.92±16.04	90.81±15.10	22.54	<0.001
Role Physical RP	68.44±39.40	79.50±34.70	9.63	<0.001
Bodily Pain BP	62.65±14.72	82.40±21.20	34.32	<0.001
General Health GH	56.54±12.02	67.30±21.90	19.18	<0.001
Vitality VT	65.63±11.55	71.40±15.80	13.25	<0.001
Social Function SF	98.48±24.13	85.30±18.10	20.10	<0.001
Role Emotional RE	81.47±32.43	76.50±38.50	4.46	<0.001
Mental Health MH	62.18±10.56	73.50±15.70	26.80	<0.001
Total Score of Living Quality	71.91±13.04	95.74±23.21	39.88	<0.001

3.2. Score of Living Quality of the Elderly with Different Characteristics

The differences in the scores of living quality of 1914 elderly people with different demographic characteristics were statistically significant. The results showed that there were significant differences in the scores of living qualities in different gender ($P = 0.025$), age ($P < 0.001$), marriage ($P < 0.001$), nationality ($P = 0.041$), educational level ($P < 0.001$), exercise ($P < 0.001$) and chronic diseases ($P < 0.001$). The score of women's living quality was higher than that of men; The older the age, the lower the quality of life. The score of married elderly is higher than that of divorced elderly, and the score of living quality of the elderly who have received secondary or higher education is higher than those who have received elementary education or below. See Table 2 for details.

3.3. Scores of Health Promotion Lifestyle of the Elderly with Different Characteristics

A comparison of differences in scores of health promotion lifestyle among older adults with different demographic characteristics showed statistically significant differences. There were statistically significant differences in the comparison of scores by gender ($P=0.004$), age ($P<0.001$), marriage status ($P=0.012$), an educational level ($P=0.005$), and exercise status scores ($P<0.001$), while there were no statistically significant differences in the comparison of scores by ethnicity ($P=0.259$) and chronic disease ($P=0.997$). The results showed that women scored higher than men, the higher the age of the elderly the lower the level of health promotion lifestyle, and the overall score of the married was higher than that of widowed elderly, as detailed in Table 3.

Table 2. Comparison of Scores of Living Quality of the Elderly with Different Characteristics

Variables	Classification	Number of Cases	Proportion (%)	Score ($\overline{x}$±s)	t/F/H Value	P Value
Gender	Male	966	50.5	71.25±12.97	-2.237	0.025
	Female	948	49.5	72.59±13.09		
Age	60～	583	30.5	73.94±11.81*	32.53	＜0.001
	65～	806	42.1	72.45±12.63		
	70～	525	27.4	68.85±14.39*		
Marital status	Married	1572	82.1	72.62±12.80*	8.972	＜0.001
	Single	29	1.5	70.58±16.62		
	Divorced	51	2.7	68.34±15.14*		
	Widowed	262	13.7	68.51±13.06		
Nationalities	Han	697	36.4	72.67±12.97*	3.194	0.041
	Zhuang	1080	56.4	71.26±13.14*		
	Other Minorities	137	7.2	73.19±12.40		
Educational Level	Elementary School and below	1062	55.5	70.52±12.91*	15.491	＜0.001
	Middle/High School	720	37.6	74.00±12.91*		
	College and above	132	6.9	71.76±13.40		
Frequency of Exercise	6 or more times per week	287	15.0	64.39±16.05*	148.425	＜0.001
	3-5 times per week	526	27.5	71.40±12.89*		
	1-2 times per week	394	20.6	69.94±12.20*		
	Never exercise	707	36.9	76.45± 1.21*		
Chronic Disease	Yes	565	29.5	64.49±12.28	0.615	＜0.001
	No	1349	70.5	75.02±12.06		

Note: * indicates that there is a difference between the two multiple comparisons between groups and their first group, P < 0.05.

Table 3. Comparison of Scores of Health Promotion Lifestyle of Older Adults with Different Characteristics

Variables	Classification	Number of Cases	Proportion (%)	Score ($\overline{x}$±s)	t/F/H Value	P Value
Gender	Male	966	50.5	93.72±13.90	-2.905	0.004
	Female	948	49.5	95.56±13.58		
Age	60～	583	30.5	96.40±14.22*	11.666	＜0.001
	65～	806	42.1	94.80±12.99*		
	70～	525	27.4	92.40±14.61*		
Marital status	Married	1572	82.1	94.88±13.84*	3.657	0.012
	Unmarried	29	1.5	93.79±13.52		
	Divorced	51	2.7	98.47±18.04		
	Widowed	262	13.7	92.45±13.21*		
Nationalities	Han	697	36.4	94.99±12.99	2.701	0.259
	Zhuang	1080	56.4	94.34±14.57		
	Other Minorities	137	7.2	95.04±13.00		
Educational Level	Elementary School and below	1062	55.5	94.44±14.13*	5.257	0.005
	Middle/High School	720	37.6	94.22±13.48*		
	College and above	132	6.9	98.39±13.90*		
Frequency of Exercise	6 or more times per week	287	15.0	88.41±13.26*	88.387	＜0.001
	3-5 times per week	526	27.5	93.95±14.13*		
	1-2 times per week	394	20.6	97.53±14.64*		
	Never exercise	707	36.9	96.04±12.73*		
Chronic Disease	Yes	565	29.5	94.63±14.13	0.004	0.997
	No	1349	70.5	94.63±13.81		

Note: * indicates that there is a difference between the two multiple comparisons between groups and their first group, P < 0.05.

3.4. Typical Correlation Analysis of Health Promotion Lifestyle and Living Quality of Elderly People in Guangxi

To understand the relationship between health promotion lifestyle and quality of life in older adults, typical correlation analyses were conducted with each dimension of health promotion lifestyle as X variables (nutrition=X1, health responsibility=X2, self-actualization=X3, interpersonal support=X4, exercise=X5 and stress management=X6) and each dimension of quality of life as Y variables (physical function PF=y1, role physical RP=y2, bodily pain BP=y3, general health GH=y4, vitality VT=y5, social function SF=y6, role emotional RE=y7, and mental health MH=y8), respectively, and a total of six pairs of typical variables were obtained. The six pairs of typical correlation coefficients were tested, and the differences were statistically significant ($P < 0.001$), and their correlation coefficients were 0.592, 0.502, 0.288, 0.167, 0.113, and 0.081 in order, as detailed in Table 4. the results showed that it was the first and second pairs of typical variables that reflected the main correlation between the two groups of variables. Although the remaining four pairs of typical variables can also reflect the correlation between the two groups of variables to some extent, the correlation is weak, while the cumulative contribution of the first two pairs of typical variables has reached 86.3%, and the correlation between them is detailed in Figure 1. Therefore, only the first and second pairs of typical variables were used to explain the relationship between the two groups of variables in this study. According to the standardized typical variable coefficients, it can be seen that interpersonal support is negatively related to V1, exercise, and stress management are positively related to V1, vitality VT, social functioning SF, and mental health MH are negatively related to W1, and general health GH is positively related to W1. Health responsibility was negatively correlated with V2, self-actualization, and interpersonal support were positively correlated with V2; physical function PF, role physical RP were positively correlated with W2, and bodily pain BP was negatively correlated with W2.

The first pair of typical standardized linear relation functions are:

V1=0.141X1-0.289X2+0.176X3-0.684X4+0.602X5+0.42X6

W1=0.02y1+0.173y2-0.11y3+0.473y4-0.417y5-0.391y6-0.086y7-0.314y8

The second pair of typical standardized linear relation functions are:

V2=0.081X1-0.459X2+0.638X3+0.411X4+0.179X5+0.057X6

W2=0.324y1+0.244y2-0.402y3+0.177y4+0.066y5+0.198y6-0.094y7+0.021y8

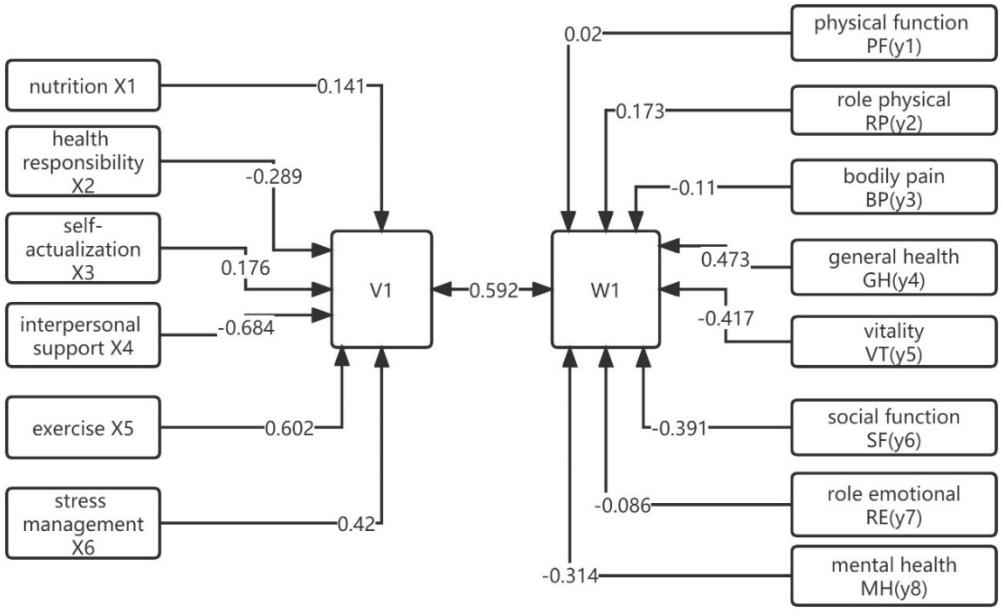

Figure 1. First Pair of Typical Correlation Path Diagrams

Table 4. Typical Correlation Analysis between Health Promotion Lifestyles and Living Quality of the Elderly in Guangxi

Number of Typical Variables	Relevance	Eigenvalue	Contribution Rate	Cumulative Contribution Rate	Approximate F-value	P value
1	0.592	0.539	0.531	0.531	37.05	＜0.001
2	0.502	0.338	0.332	0.863	24.32	＜0.001
3	0.288	0.091	0.089	0.952	10.87	＜0.001
4	0.167	0.029	0.028	0.981	6.12	＜0.001
5	0.113	0.013	0.013	0.994	4.68	＜0.001
6	0.081	0.007	0.007	1.000	4.21	＜0.001

The results show that there is a moderate correlation between health promotion lifestyle and quality of life, and the

linear equation of the two can understand the magnitude of the effect of each indicator on the typical variables. The first pair of typical variables V1 mainly reflects the level of interpersonal support (X4), exercise (X5), and stress management (X6) of the health promotion lifestyle; W1 mainly reflects general health GH (y4), vitality VT (y5), social functioning SF (y6), and mental health MH (y8) levels of life quality; in the second pair of typical variables, V2 mainly reflects health responsibility (X2), self-actualization (X3), and interpersonal support (X4) levels of health promotion lifestyle, and W2 mainly reflects physical functioning PF (y1), role physical RP (y2), and bodily pain BP (y3) levels of life quality.

4. Conclusion

The results of the study showed that the scores of quality of life dimension the elderly in Guangxi were lower than those of the national norm, except for the social function SF and emotional function RE dimension scores, which were slightly higher than those of the national norm. The slightly higher scores of social function SF and emotional function RE dimensions may be attributed to the harmonious social interpersonal relationships of the elderly in Guangxi and their unique ethnic cultural activities, which promote the emotional communication of the elderly. The overall score of living quality of the elderly in Guangxi is lower than the national norm. The difference in the comparison of the results may be related to the differences in the demographic characteristics of the sample, the representativeness of the sample, the backward economic situation, health and medical level in Guangxi, and the living habits and cultural background of the elderly in different regions.

The comparison of life quality scores of the elderly with different characteristics shows that women's life quality scores are better than men, which may be related to women's being more keen to participate in social activities, women's frequent interpersonal communication and richer sources of health information. The analysis results of different age groups show that age is an important factor affecting the living quality of the elderly [13]. The older the age, the worse the quality of life. This result is related to the decline of the body function of the elderly, and the level of quality of life decreases with the decrease of the physiological function of the elderly. Comparing the scores of the elderly with different marital statuses, the married elderly score higher than the divorced elderly. The results show that the divorced elderly may suffer a certain mental blow, or psychological injury and have certain bad emotions, resulting in a reduction of the living quality. Therefore, for the divorced elderly, family members are suggested to correctly guide them to vent their bad emotions, pay attention to the psychological situation of the elderly, and give more support and care. The difference in the scores of living quality of the elderly of different nationalities may be related to the influence of different ethnic customs, cultures, and living environments. The scores of life quality of the elderly with different educational levels show that the overall score of life quality of the elderly with high educational levels is better than that of the elderly with low educational levels. This may be related to the fact that the elderly with higher education have a stronger ability to accept new information and a better understanding of health knowledge than those with lower educational level. The overall score of the elderly who do not exercise is higher than that of the exercisers (exercise 6 or more times a week / 3-5 times / 1-2 times), which may be related to the age of the sample in this study. The physical function, role physiological, and vitality of the elderly will decline in varying degrees. Therefore, exercise will increase the consumption of the elderly themselves. The total score of living quality of the elderly without chronic diseases is higher than that of the elderly with chronic diseases. The results show that chronic diseases are important factors affecting the level of living quality of the elderly. The long-term treatment of chronic diseases brings a heavy burden to the life economy of the elderly and the decline of body function, bodily pain, and psychological pressure are the main reasons for the decline in quality of life. Therefore, full attention and support are suggested to offer to the elderly and relevant medical and elderly care service system should be optimized so as to improve the living quality of the elderly.

The survey results show that the total score of the health-promoting lifestyle of the elderly in Guangxi is 94.63 ± 13.0, which is lower than the total score of the health-promoting lifestyle study conducted by scholars in the last 10 years [14]. It shows that the health-promoting lifestyle of the elderly in Guangxi is relatively backward and the popularization of health education for the elderly is poor. This result may also be affected by the health culture concept of the elderly in Guangxi, the impact of economic level and living habits. The score of health-promoting lifestyle shows that women are better than men, which shows that women's health literacy is higher than men. Women pay more attention to their own health, and men's health-promoting lifestyle needs to be further improved. Therefore, when carrying out health education and publicity, measures should be taken according to different gender characteristics. The overall score of health-promoting lifestyle of the elderly of different ages shows that the higher the age of the elderly, the lower the level of health-promoting lifestyle, which shows that the self-care ability and energy decrease with the increase of age, and the score level of health-promoting lifestyle decreases with the increase of age. To improve the health and lifestyle of the elderly, family members are suggested to give support and care. The overall score of health-promoting lifestyle of the elderly with different marital statuses shows that the overall score of married and divorced elderly is better than that of widowed elderly, which may be related to the psychological and family support. Different marital status affects the choice of lifestyle of the elderly. The overall score of health-promoting lifestyle of the elderly with different educational levels shows that educational level is an important factor affecting the elderly to receive health information. The elderly with different cultural levels have different thinking modes. Therefore, the level of health-promoting lifestyle is uneven. The overall score of exercise for the elderly shows that the elderly who exercise 6 times or more a week have the lowest score, the elderly who exercise 1-2 times a week have the highest score of health promotion lifestyle, followed by the elderly who do not exercise. This result may be related to the physiological state of the elderly. A reasonable frequency of exercises is conducive to delaying the decline of physical function, maintaining the spirit, better integrating the elderly into the social communication environment, and maintaining the health level of the elderly.

The results of typical correlation analysis showed that the first pair of typical variables V1 was mainly influenced by interpersonal support, exercise, and stress management; W1 was mainly influenced by general health GH, vitality VT,

social function SF, and mental health MH; in the second pair of typical variables, V2 was mainly influenced by health responsibility, self-actualization, and interpersonal support, and W2 was mainly influenced by physical function PF, role physical RP, and bodily pain BP. The overall typical correlation between the health promotion lifestyle group and the quality of life group was significant, and they were positively correlated. That is, the higher the health promotion lifestyle level of the elderly, the better their quality of life is. Therefore, improving the level of health promotion lifestyle is an effective means to improve the living quality of elderly people in Guangxi. Health promotion education programs in terms of health responsibility, self-actualization, interpersonal support, exercise, and stress management are suggested to be provided by government, to fully understand the needs of the elderly in different situations and levels of old age and to better serve the elderly population [15]. At the same time, knowledge about health-promoting should be popularized for the elderly population with relatively low health awareness in the area, and health behaviors should be regulated to promote the physical and mental health of the local elderly for the purpose of reducing the incidence of chronic diseases in the elderly and improve their quality of life level.

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