Analysis of Health Literacy level and its Influencing Factors among the Elderly in a Certain City of China

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Abstract:Objective To understand the health literacy level and its influencing factors of elderly in Guangzhou, so as to provide scientific evidence for formulating effective intervention measures and policies. **Methods** Stratified cluster random sampling was used to conduct a survey on health literacy among elderly in Guangzhou in 2022. Logistic regression was used to analyse the influencing factors of their health literacy level. **Results** The total level of elderly's health literacy in Guangzhou is 16.9%; From the three dimensions of health literacy, 13.6% of elderly have health knowledge and conceptual literacy, 23.7% of healthy lifestyle and behaviour, and 3.4% of health skills literacy. From high to low, the level of the six aspects of health literacy are scientific health concept literacy (37.3%), safety and emergency literacy (35.7%), health information literacy (28.9%), basic medical literacy (25.4%), chronic disease prevention and control literacy (15.3%), and infectious disease prevention and control literacy (11.9%). And there are significant differences among elderly of different ages, educational level, housing population and years of having diseases ($P < 0.05$). **Conclusion** The overall health literacy of elderly in Guangzhou is relatively high in China, but still need to be improved, esp. in health skills and infectious disease prevention and control literacy.

1. Introduction

With the improvement of the living standard and the development of medical and health care in China, the death rate of the population has declined and the elderly population has increased rapidly, making China one of the fastest aging countries in the world. Health literacy refers to individuals' access to and understanding of basic health information and services, and use these information and services to make correct decisions to maintain and promote their own health [1]. The Healthy China 2030 Plan [2] calls for improving the health-related literacy of the nation's residents and in 2020, the CPC Central Committee put forward for the first time the “National strategy of actively responding to population ageing” [3]. Making the elderly have a high level of health literacy is an important guarantee and prerequisite to improve the healthy life expectancy and life quality of the elderly [4].

To achieve this goal, the very first step is to understanding and evaluating the current level of elderly's health literacy, analysing the influencing factors and thus formulating countermeasures to improve their health literacy. The elderly living in Guangzhou (provincial capital of Guangdong province) was chosen as the survey subjects.

2. Subjects and methods

2.1. Subject

The elderly people refers to those who are 65 and older. Stratified cluster random sampling was conducted between March to June of 2022 to investigate the elderly who have no communication problems and have lived for more than 6 months in Guangzhou, and were willing to join the survey.

2.2. Methods

2.2.1. Investigation questionnaire

The research was mainly conducted using the *Guangzhou Residents' Health Literacy Questionnaire*, and mobile terminal devices were used to collect data through questionnaires in field survey. The main body of

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the questionnaire contains three dimensions (basic health knowledge and concept, healthy lifestyle and behaviour, and health skills) and six aspects (scientific health concept, infectious disease prevention and control literacy, chronic disease prevention and control literacy, safety and emergency literacy, basic medical literacy, and health information literacy), making 56 questions in total. Those who get 80% of the total score or higher are regarded as having health literacy.

2.2.2. Statistical analysis

Spss19.0 was used as the statistic software. χ^2 test and Logistic regression analysis were used for analysing the difference and influencing factors of elderly's health literacy.

3. Results

3.1. General data

A total of 310 questionnaires were distributed in this survey and 296 were effectively recovered, with an effective rate of 95.48%. The demographic characteristics data are shown in Table 1.

3.2. The level of elderly's health literacy in Guangzhou and its three-dimensions

The health literacy level of elderly in Guangzhou is 16.9%, and there are significant differences among elderly of different ages, educational level, housing population and years of having diseases (P <0.05). From the three dimensions of health literacy, 13.6% of elderly in Guangzhou have health knowledge and conceptual literacy, 23.7% of healthy lifestyle and behaviour, and 3.4% of health skill literacy. According to statistical analysis, health knowledge and concept literacy is related to educational level, housing population and health state (P<0.05), while healthy lifestyle and behaviour is related to ages, marriage state, educational level, housing population (P<0.05), and health skill literacy is related to marriage state, educational level, health state and years of having diseases (P<0.05), as shown in Table 2.

Table 1. General data of the elderly.

Demographic characteristics	Numbers	Percentage (%)
Gender		
Men	137	46.3
Women	159	53.7
Age		
65-79	189	63.9
80-	107	36.1
Marriage state		
Unmarried	6	2.0
In marriage	249	84.1
Divorce	12	4.1
Widow(er)	29	9.8
Education level		
Illiteracy	41	13.9
Primary school	73	24.7
Junior & high school	146	49.3
Colleges & Universities	36	12.2
Housing population		
1-2	21	7.1
3-	275	92.9
Monthly living expenses		
0-1000	102	34.5
1000-	194	65.5
Health state		
Healthy	97	32.8
Unhealthy	199	67.2
Years of having diseases		
0	97	32.8
<5	129	43.6
5-10	53	17.9
>10	17	5.7

3.3. Six aspects of health literacy of elderly in Guangzhou

From six aspects of health literacy of elderly in Guangzhou, the levels of scientific health concept (37.3%), and safety and emergency literacy (35.7%) are relatively high, while the levels of infectious disease prevention and control literacy (11.9%) and chronic disease prevention and control literacy (15.3%) are relatively low. Scientific health concept is related to gender, marriage state, educational level and health state (P<0.05), infectious disease prevention and control literacy is related to gender, educational level, health state and years of having diseases (P<0.05). Chronic disease prevention and control literacy is related to gender, marriage state, educational level, health state and years of having diseases (P<0.05), while safety and emergency literacy is to gender, age, marriage state, educational level, and housing population (P<0.05). Basic medical literacy is related to age, marriage state, educational level, and health state (P<0.05), while health information literacy to age, marriage state, educational level, and years of having diseases (P<0.05), as shown in Table 3.

Table 2. The level of elderly's health literacy and its three-dimensions (%).

Demographic characteristics	Total Health Literacy	basic knowledge and concept	healthy lifestyle and behaviour	basic skills
Gender				
Men	22.7	18.2	31.8	8.6
Women	13.5	10.8	18.9	5.7

χ^2	0.832	0.640	1.268	0.297
P	0.362	0.424	0.260	0.586
Age				
65-79	18.2	14.5	25.5	3.6
80-	6.8	1.9	3.7	5.6
χ^2	4.378	3.365	6.675	0.753
P	0.036	0.067	0.01	0.386
Marriage state				
Unmarried	16.7	33.3	65.6	16.7
In marriage	17.6	15.7	19.6	2.7
Divorce	8.3	8.3	45.9	44.1
Widow(er)	19.4	3.5	37.8	3.5
χ^2	3.315	7.259	25.935	68.980
P	0.346	0.064	0.000	0.000
Education level				
Illiteracy	2.6	3.7	12.5	2.1
Primary school	13.3	11.3	6.7	4.6
Junior & high school	17.9	14.3	21.4	13.7
Colleges & Universities	37.6	25.3	71.2	21.7
χ^2	20.943	10.808	73.359	65.987
P	0.000	0.013	0.000	0.000
Housing population				
1-2	81.0	61.9	57.1	4.8
3-	15.6	12.1	16.7	3.5
χ^2	19.174	15.439	12.023	0.215
P	0.000	0.000	0.001	0.643
Monthly living expenses				
0-1000	14.2	12.4	23.9	4.9
1000-	18.7	14.3	23.6	2.6
χ^2	1.013	0.214	0.003	0.599
P	0.314	0.644	0.958	0.439
Health state				
Healthy	19.6	19.1	23.8	2.1
Unhealthy	15.8	10.5	23.7	8.5
χ^2	0.510	4.190	0.001	5.720
P	0.475	0.041	0.981	0.017
Years of having diseases				
0	21.6	18.6	23.8	2.1
<5	10.1	12.4	20.3	4.7
5-10	15.1	11.3	31.9	1.9
>10	5.9	0.0	32.3	11.8
χ^2	11.615	5.851	2.812	26.648
P	0.009	0.119	0.422	0.000
Total health literacy	16.9	13.6	23.7	3.4

Table 3. The level of six types of health literacy of elderly in Guangzhou (%).

Demographic characteristics	scientific health concept literacy	infectious disease prevention and control literacy	chronic disease prevention and control literacy	safety and emergency literacy	basic medical literacy	health information literacy
Gender						
Men	45.5	18.2	27.3	50.0	22.7	31.8
Women	32.5	8.1	8.1	29.7	27.0	27.0
χ^2	5.002	6.695	19.599	12.121	0.673	0.772
P	0.025	0.010	0.000	0.000	0.412	0.380
Age						
65-79	38.2	12.7	14.5	40.0	27.3	27.3
80-	25.0	0.0	25.0	0.0	0.0	50.0
χ^2	1.385	2.888	1.576	12.757	7.314	4.695
P	0.239	0.089	0.209	0.000	0.007	0.030
Marriage state						
Unmarried	66.7	16.7	83.3	83.3	50.0	66.7
In marriage	37.3	11.8	11.8	35.5	25.5	25.8
Divorce	50.6	8.3	8.3	49.2	8.3	46.9
Widow(er)	19.8	21.2	40.3	37.9	21.1	20.6

χ^2	12.296	3.604	43.822	9.612	18.464	17.440
P	0.006	0.308	0.000	0.022	0.000	0.001
Education level						
Illiteracy	37.5	12.5	0.0	12.5	12.5	37.5
Primary school	20.1	1.6	13.3	33.3	18.9	22.1
Junior & high school	35.7	14.3	14.3	28.6	24.9	27.1
Colleges & universities	69.2	21.3	39.6	72.3	44.1	53.8
χ^2	34.062	17.497	22.828	82.834	17.443	14.058
P	0.000	0.001	0.000	0.000	0.001	0.003
Housing population						
1-2	4.8	9.5	9.5	90.5	19.0	14.3
3-	37.9	12.1	15.5	36.2	25.9	29.3
χ^2	3.024	0.685	0.916	8.554	1.734	2.059
P	0.082	0.408	0.339	0.003	0.188	0.151
Monthly living expenses						
0-1000	40.5	9.1	18.2	31.8	31.8	27.3
1000-	35.1	13.5	13.5	40.5	21.6	29.7
χ^2	0.983	1.290	1.163	2.244	3.783	0.203
P	0.321	0.256	0.281	0.134	0.052	0.652
Health state						
Healthy	28.6	3.1	23.8	38.1	33.1	23.8
Unhealthy	42.1	18.6	10.5	36.8	21.1	31.6
χ^2	5.297	21.946	9.230	0.045	5.379	1.990
P	0.021	0.000	0.002	0.831	0.020	0.158
Years of having diseases						
0	28.6	0.0	23.8	38.1	33.3	23.8
<5	44.1	12.0	12.0	32.0	20.0	28.0
5-10	40.2	30.0	10.0	50.0	20.0	50.0
>10	33.3	33.3	0.0	37.3	33.3	0.0
χ^2	6.077	36.475	10.737	5.080	6.675	18.335
P	0.108	0.000	0.013	0.166	0.083	0.000
Total health literacy	37.3	11.9	15.3	35.7	25.4	28.9

3.4. Influencing factors of elderly's health literacy in Guangzhou

Taking the elderly's health literacy level as the dependent variable, and factors with statistical significance (ages, educational level, housing population and years of having diseases) in Table 2 as the independent variable, a multi-factor Logistic regression analysis was conducted. The results show that educational level is the influencing factor of elderly's health literacy in Guangzhou, as shown in Table 4.

Table 4. The Logistic regression analysis of influencing factors of health literacy of elderly.

Model	*B*	Std. Error	*P*	OR	95%CI
Age					
65-79				1	
80-	8.182	0.186	0.189	1.575	0.800-3.101
Education level					
Illiteracy				1	
Primary school	0.451	0.182	0.014	1.571	1.098-2.252
Junior & high school	1.262	0.318	0.000	3.131	1.895-6.581
Colleges & Universities	1.463	0.362	0.000	4.317	2.124-8.776
Housing population					
1-2				1	
3-	0.494	0.483	0.307	1.638	0.635-4.225
Years of having diseases					
0				1	
<5	-0.488	0.512	0.339	0.612	0.223-1.673
5-10	-0.413	0.285	0.148	0.664	0.381-1.157
>10	-0.389	0.813	0.685	0.837	0.186-3.029

4. Conclusion

4.1. A relative low level of elderly's health literacy in Guangzhou

As shown in the results, the overall level of health literacy of elderly in Guangzhou is 16.9%, lower than the residential health literacy level in China (27.78%) [5] and the level of 28.6% of the residents in the central urban area of Guangzhou [6].

However, compared with elderly living in other provinces and cities of China, it is higher than the survey results of 3.7% in Xinjiang Uygur Autonomous Region [7] and 14% in Heilongjiang Province [8].

4.2. Analysis of influencing factors of elderly's health literacy in Guangzhou

For the overall health literacy, elderly with younger age (18.2%) are better than older age (6.8%), which is consistent with surveys in Shanxi province [9] and in USA [10]. The reason for this may be that aging affects the ability of older people to process information and the speed of reasoning. In the information age, a large number of pictures and words on the internet provide a huge amount of medical care, information, increasing the difficulty of maintaining the health of the elderly [11]. According to the result of multi-factor Logistic regression analysis, educational level is the main influencing factor of health literacy level of elderly in Guangzhou, which is same with survey held in Heilongjiang Province [8] and Guilin city [12] in China, as well as with survey in Catalonia[13] of Spain. Elderly people with low educational level usually lack health knowledge and are difficult to follow the doctor's advice for self-health management, such as failure to correctly understand drug labels or health information, thus affecting the effect of medical treatment [14]. As for housing population, it is better for elderly to live with fewer people, which is the same with the survey held in Guilin city [12]. This maybe the more population in a house, the less care can be put on elderly, resulting to their low health literacy.

From the three dimensions of health literacy outcome, it can be found that the health skills level of elderly in Guangzhou is as low as 3.4%, indicating they are better at knowledge than skills. This is consistent with the research results in Guilin city [12], and the theoretical model of Knowledge, Attitude and Practice (KAP model). From the six aspects of health literacy, elderly in Guangzhou perform better in scientific health concept (37.3%) and safety and emergency literacy (35.7%), while the levels of infectious disease prevention and control literacy (11.9%) is the lowest, which is consistent with survey held in Tai'an city [15]and Shanghai city [16] in China. As the disease spectrum changes, infectious disease is not as threatening as in the past, but it doesn't mean its threat is gone. The Covid-19 epidemic has killed many people in China, a large proportion of which was the elderly group. The prevention and control of infectious disease is of vital importance to elderly's life expectancy. Another interesting point is that the marriage state seems to make a difference in health literacy from the five aspects of health literacy out of six, namely scientific health concept literacy, chronic disease prevention and control literacy, safety and emergency literacy, basic medical literacy and health information literacy. Those who never get married have almost the highest level on the above 5 aspects, indicating that they may be less buried in the trivial things from marriage and have more energy focusing on their own health.

In conclusion, the overall health literacy of elderly in Guangzhou is relatively high in China compared to other cities or provinces, but there is still a gap to goals set by the Chinese government. More efforts should be made to enhance their health skills and infectious disease prevention and control literacy. Those elderly who are less educated needs the most attention by community and government.

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