Original Article

Analysis on impact factors of health literacy among female residents among 15–69 years-old in Huai'an

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Background: Health literacy refers to the ability of an individual to acquire and understand health information and use that information to maintain and promote their own health. The evaluation index of residents' health literacy has been incorporated into the national health development plan. The outline of "healthy China 2030" plan issued and implemented by the CPC Central Committee and the State Council in 2016 clearly requires that the health literacy and lifestyle monitoring system covering the whole country should be improved and the health literacy of residents should be greatly improved. The Health literacy level should reach 20% in 2020 and 30% in 2030. Jiangsu provincial Party committee, provincial government, Huai'an Municipal Party committee and municipal government have also formulated corresponding health literacy evaluation index requirements. Main text to evaluate the distribution of health literacy and its impact factors in female residents between the ages of 15 and 69 in Huai'an city and provide the basis for establishment of comprehensive health educational strategies and measures.

Methods: A cross-sectional survey method and multi-stage stratified random sampling was adopted. Residents between the ages of 15 and 69 were surveyed in Huai'an city from October till December, 2013. This research includes demographic data, such as age, gender, occupation, etc., and three dimensions of health literacy, namely, basic knowledge and concept, healthy lifestyle and behavior, and basic skills. The collected data were analyzed via X^2-test and logistic regression.

Results: The health literacy ratio standardized was 13.8% among all the 2,486 subjects. Single factor analysis showed that health literacy among female residents between the ages of 15 and 69 in urban areas was higher than rural areas, increasing with the increasing degree of cultural knowledge. In addition, the health literacy of different groups of ages, per capita annual family income and occupations were statistically significant separately ($P<0.05$). Multiple regression analysis showed that the odds ratios OR (95% CI) was 1.904 (1.002–3.616), 3.579 (1.975–6.484), 4.048 (2.083–7.868), 7.090 (3.483–14.434) when comparing primary school, junior high school, senior high school/vocational high school/technical secondary school, junior college/undergraduate degree or above with illiteracy; The odds ratios OR (95% CI) was 2.073 (1.408–3.051) and 3.848 (2.283–6.484) when comparing workers and employees in organs and institutions with farmers. The odds ratios OR (95% CI) was 1.341 (1.003–1.792) when comparing people whose household income is over 10,000 (¥) with those below 10,000. All these were positive correlation factors.

Conclusions: The rate of health literacy standardized among female residents in Huai'an city was 13.8%. It has been at a low level for a while. Which means the health literacy intervention should be enhanced in order to comprehensively improve the health literacy condition of the female residents.

Keywords: Health literacy; impact factors; female permanent residents

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Introduction

In 2013, the National Health and Family Planning Commission (N) proposed a strategy for incorporating health literacy into the comprehensive evaluation index system for economic and social development. The Huai'an Government's 2013 government work report takes "the fundamental purpose of development for the people, and promotes the health of residents" as an important development goal. The municipal government proposes the development goal of building a healthy city in Huai'an, and residents' health literacy is one of the important indicators. In order to implement the spirit of superior instructions, as a research, we classified health literacy, such as in-depth research on the status and influencing factors of female health literacy. This study was conducted from October to December 2013, and the results are reported as follows:

Methods

Objects of the survey

The permanent residents of urban and rural areas who are between 15 and 70 years of age and the non-local household registration population who have lived in the local area for more than 6 months are our targets of investigation. Students who have been studying abroad for more than 6 months have not been included in the survey.

Sampling method

Using multi-stage stratified random sampling, all counties are surveyed; streets/towns, neighborhood committees/villages use the PPS method; households use the random number method;

Survey method

The cross-section survey method is adopted in this research. The investigators are county and district CDC health technicians follow the principle of confidentiality and use a combination of self-filling and face-to-face inquiry by investigators. The 2013 National Residents Health Survey Questionnaire of China Health Education Center has a Cronbach coefficient of 0.931; three aspects of the literacy Cronbach coefficient, basic health knowledge and philosophy is 0.871, healthy lifestyle and behavior 0.774, basic skills 0.802; The half-validity coefficient of the questionnaire is 0.808, and the reliability and validity are both meet requirement (1).

Quality control

Establish an investigation leading group to actively organize, earnestly train, strictly control quality, and supervise the whole process; carry out provincial, city, county (district) three level on-site supervision at the monitoring points; at the end of the survey, 5% of the questionnaire calls will be reviewed.

Statistical methods

EpiData 3.02 and SPSS 17.0 software were used to establish a database and perform statistical analysis. Urban and rural areas, gender, age, etc. are weighted for standardization using the 6th census data. Univariate and multivariate analysis were performed by chi-square test and Logistic regression analysis, respectively. The dependent variable (assignment: with health literacy =1; without health literacy =0) (*Table 1*), multivariate analysis was performed. $P<0.05$ was considered statistically significant.

Results

General characteristics

The survey data of 2,486 female resident residents aged 15 to 69 showed that 1,217 (49.0%) were urban population and 1,269 (51.0%) were rural population; their average age was (46.3±12.9); 35-year-old age group is the most, 15-year-old is the least; in the cultural literacy group, the number of illiterate or literate is the largest, college/undergraduate and above are the least; in the occupation type, the number of farmers is the largest, and the number of students is the least. Furthermore, 47.0% of the households have an average annual income of less than 10,000 Yuan (*Table 2*).

Table 1 Logistic regression coding and assignment

Code	Variable	Assignment
Y	Health literacy	Not available =0; available =1
X1	Urban and rural	Rural =0; urban =1
X2	Age	15– =0; 25–=1; 35– =2; 45– =3; 55– =4; 65–69 =5
X3	Educational background	Illiteracy or little literacy =0; primary school =1; junior high school =2; high/vocational school =3; college/undergraduate and above =4
X4	Occupation	Peasants =0; workers =1; students =2; institutions =3
X5	Annual income per capita	<10,000 =0; ≥10,000 =1

Health literacy of female resident residents

After the sixth census data was standardized, the health literacy level of female resident residents aged 15–69 years was 13.8%, which was lower than 17.6% of men. Women had three dimensions of literacy and had the lowest healthy lifestyle and behavior. Univariate analysis showed that there were statistically significant differences in health literacy levels among different genders, urban and rural areas, education, age, income, and occupation. Multivariate analysis results are shown in *Table 3*.

Discussion

Health and health literacy levels are closely related. People with poor health knowledge, poor lifestyles, poor health, and poor treatment outcomes often have lower levels of health literacy (2). Women's lifestyles and living habits are directly related to the health of the whole family and the quality of the birth population (3).

The results showed the lowest levels of healthy lifestyle and behavioral literacy. Consistent with the "knowledge, trust, and deed" theory, knowledge, beliefs, and health skills may not always translate into healthy behaviors (4).

The results of multivariate analysis are consistent with the findings of Li (5), Leng (6), and Liu (7). People with a high level of education have better ability to analyze, process, and use these health information (8-10), Surveys in developed countries such as the United States and Australia have also found that education is a positively related factor for health literacy, suggesting that in a sense, attaching importance to education is to attach importance to health, and only by improving the cultural level of female populations can they effectively improve their health literacy. The government should pay attention to the phenomenon of low enrollment and high dropout rates of girls in rural areas, actively promote the balanced development of men and women in education, and formulate corresponding health education communication strategies based on the characteristics of women of different educational levels; the results show that occupations are also the health literacy of female residents Factors influencing the level; the family's per capita annual income level is high, and the female residents' health literacy level is also high. Consistent with the results of studies by Liu (11) and other studies, farmers and low-income people generally have low academic qualifications and poor labor skills. Because they are engaged in heavy labor and long working hours, they often resist various education and learning including health education. Therefore, agricultural mechanization, perfecting the distribution system and promoting economic development are very important (12).

Based on the above results, we recommend that local residents, especially females with lower annual income per peasant, student, education level, and family, should be the key population for health education. Local governments should strengthen the construction of health education and maternal and child health institutions, and solve the problem of insufficient funds financially to improve the quality of maternal and child health and health education personnel (13). At the same time, it is necessary to improve the utilization efficiency of health resources (14), ensure the quality and effectiveness of women's health services (15), and translate research results related to maternal and child health and health education into policies (16). Relevant institutions such as hospitals, maternity and child health centers, and communities must strengthen women's health literacy as a key group of people in order to comprehensively improve the health literacy of female

Table 2 Univariate analysis of demographic characteristics and health literacy influencing factors of female residents aged 15 to 69 in Huai'an city, n (%)

Characteristics	Investigator number	Literate people	Percentage (%)	Standardization rate (%)	χ^2 value	P value
Urban and rural					18.952	0.000
Urban	1,217	194	15.9	16.9		
Rural	1,269	100	7.9	10.5		
Age					48.689	0.000
15–	201	35	17.4	18.1		
25–	313	67	21.4	20.2		
35–	640	94	14.7	15.0		
45–	624	56	9.0	9.3		
55–	573	32	5.6	5.2		
65–	135	10	7.4	7.4		
Educational					179.098	0.000
Illiteracy or little literacy	826	24	2.9	3.2		
Primary school	481	37	7.7	7.1		
Junior high school	665	95	14.3	14.3		
High/vocational school	300	58	19.3	19.4		
College/undergraduate and above	214	80	37.4	35.8		
Occupation					173.714	0.000
Peasants	1,359	64	4.7	5.3		
Workers	901	152	16.9	17.7		
Students	45	6	13.3	15.9		
Institutions	181	72	39.8	38.7		
Nation					1.447	0.229
Han nationality	2,463	292	11.9	13.8		
Minority	23	2	8.7	4.8		
Annual income per capita (Yuan)					38.543	0.000
<10,000	1,169	82	7.0	8.8		
≥10,000	1,317	144	16.1	117.9		
Total	2,486	294	11.8	13.8		

residents.

In addition, as a big agricultural city, we must strengthen the work of rural health literacy. Health literacy level monitoring is only to provide theoretical basis for health promotion in Huai'an city. The ultimate purpose of health promotion is to improve residents' health knowledge, develop residents' health beliefs and improve residents' health behaviors. To achieve this goal, continuous intervention is needed to be effective. Therefore, we must continuously enrich the content of health education to increase residents' awareness and recognition of health promotion work in Huai'an City.

Table 3 Logistic regression analysis of influencing factors on health literacy of female residents aged 15 to 69 in Huai'an

Factors	β value	$S^{\bar{}}$ value	Wald χ^2 value	P value	OR (95% CI)
Urban and rural	–0.112	0.144	0.605	0.437	0.894 (0.674–1.186)
Age	0.043	0.060	0.527	0.468	1.044 (0.929–1.174)
Education background					
Illiteracy or little literacy	–	–	–	–	1.000
Primary school	0.644	0.327	3.87	0.049	1.904 (1.002–3.616)
Junior high school	1.275	0.303	17.683	0.000	3.579 (1.975–6.484)
High/vocational school	1.398	0.339	17.007	0.000	4.048 (2.083–7.868)
College/undergraduate and above	1.959	0.363	29.165	0.000	7.090 (3.483–14.434)
Occupation					
Peasants	–	–	–	–	1.000
Workers	0.729	0.197	13.664	0.000	2.073 (1.408–3.051)
Students	0.521	0.330	2.488	0.115	1.684 (0.881–3.217)
Institutions	1.347	0.266	25.604	0.000	3.848 (2.283–6.484)
Annual income per capita (Yuan)	0.293	0.148	3.929	0.047	1.341 (1.003–1.792)

Note: "–" means using this as a reference.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/jphe.2019.12.01). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The center for Disease Control and prevention of Huai'an City encoded the personal information of the population. According to ethical standards, the survey is in line with the declaration of Helsinki (as revised in 2013).

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