
A Study on the Correlation between Health-related Behavior and Medical Ecology Use of Urban Aged Group

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Abstract

The advance of health technology and reducing fatality rate increase aged population annually. Along with the changes in population structure and the public lifestyles, suffering from chronic illnesses become a primary factor in national health. Chronic illnesses are the major cause of death and suffering from illness of the aged. Health-related behavior of the aged, along with the concept of health promotion being gradually accepted by the public, is also emphasized by the public because of the huge effects on health. Aiming at the aged group in Shanghai, total 500 copies of questionnaire are distributed in this study, and 396 valid copies are retrieved, with the retrieval rate 79%. The research results show 1. significantly negative effects of health promotion behavior on outpatient visits, 2. remarkably negative effects of health promotion behavior on hospitalization days, 3. notably positive effects of health hazard behavior on outpatient visits, and 4. significantly negative effects of health hazard behavior on hospitalization days. According to the results, suggestions are proposed, expecting that the public could be healthily aging and healthily live as well as to create healthy environment and promote the public health.

Keywords: the aged group, health-related behavior, medical ecology use

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INTRODUCTION

World Health Organization (WHO) proposes the ultimate target for the achievement of health care systems, while the application of optimal strategies to promote public health is the primary issue of public health policies for various countries. National health, as the competitiveness, could extend the economic and cultural development of a country. Nonetheless, the changes in society change the birth concept of citizens. Sub-replacement fertility results in slow population growth to obviously change the population age structure in past years. The advance of health technology and the declination of fatality rate increase the aged population annually. In face of such rapidly aging growth, relevant coping policies are urgent. Providing the public with healthy aging and healthy life as well as creating healthy environment and promoting the public health are the important public issues nowadays.

Along with the changes in population structure and the public lifestyles, the suffering from chronic illnesses gradually become a key factor in national health. The cognition and importance of chronic illnesses are

therefore emphasized and concerned. Chronic illnesses are the cause of death and suffering from illnesses of the aged. Heart diseases, cerebrovascular diseases, diabetes mellitus, and hypertensive diseases are major causes of death of the aged in past years, and most of such diseases are induced by not properly controlling chronic illnesses of hypertension, hyperlipidemia, and diabetes mellitus, in which hypertension is the commonest chronic illness for the aged. For this reason, providing the aged with good lifestyles and health-related behavior could delay the occurrence of such chronic illnesses. Health-related behavior of the aged nowadays is gradually accepted by the public and the concept of health promotion is also gradually emphasized because of the major effect on health. Aiming at the health-related behavior and medical ecology use of urban aged group, the correlation research is proceeded, expecting to provide the public with healthy aging and life as well as to create healthy environment and promote the public health.

LITERATURE REVIEW

Health-related Behavior

Yang et al. (2016) defined health as the elimination of illnesses or weakness as well as completely physical, spiritual, and social healthy. In other words, health referred to completely physical, psychological, and social peace, rather than simply without illnesses or weakness. Human behavior and the lifestyles presented close effects on health; in addition to genetic and innate factors, external physical environment, such as home, workplace, and community, and social psychological environment, e.g. family, friends, and colleagues, would affect individual behaviors and lifestyles (Rutsaert et al. 2015). Duong et al. (2017) defined health-related behavior as some activities proceeded by those who regarded themselves being healthy for preventing illnesses and detecting diseases. They also classified health-related behavior into (1) preventive health-related behavior, behaviors taken to prevent the appearance of certain illnesses, e.g. health checks, exercise, and quitting smoking, (2) illness behavior, behaviors taken as ones regarded themselves being ill, e.g. ignoring the bad health conditions and then seeking for medical care after being sick, and (3) illness role behavior, behaviors taken after a patient being confirmed the sickness by a physician, e.g. following medical orders for treatment and taking medicine. Abeer et al. (2015) pointed out lifestyles, rather than health-related behavior, being used in various literatures. For instance, Merianos et al. (2017) divided lifestyles into 5 categories and then classified them into three characters of behavior to avoid hazards, preventive behavior, and health promotion behavior. Stead et al. (2015) classified health-related behavior into health promotion behavior (positive behaviors), e.g. regular exercise, good diet, stress management, and health hazard behavior (negative behaviors), e.g. smoking and drinking. Chahine et al. (2016) indicated that health-related behavior described individual behaviors, which might harm health or explain health, in daily life, and further divided health-related behavior into health promotion behavior and health hazard behavior (Shadman et al. 2016). Eriksen et al. (2015) pointed out behaviors as the interaction between an individual and the surrounding environment that health-related behavior was defined as the behavior reaction generated by the interaction between an individual and the environment; such action would directly or indirectly affect individual health as well as others' health. In other words, direct or indirect effects on health were covered in the discussion of health-related behavior. Health-related behavior was further classified into health-

related habits, secure behavior, preventive health care behavior, avoidance of bad hobbies, and avoidance of environmental hazard behavior; or, they could be briefly classified into health promotion behavior and illness prevention (Langellier et al. 2016).

Referring to Chang et al. (2017), health-related behavior is defined in this study as an individual presenting negative and positive behaviors related to health, including health hazard behavior (e.g. smoking, drinking, and betel nut chewing) and health promotion behavior (exercise and injection of influenza vaccine).

- (1) Health promotion behavior: They are divided into exercise, diet pattern, weight control, and life adjustment.
- (2) Health hazard behavior: referring to behaviors with bad effects and harm on physical health, e.g. harmful behavior, harmful habits, and harmful diet.

Medical Ecology Use

Liu et al. (2015) defined medical ecology use as an individual, when suffering from illness or seeking for preventive health care, receiving diagnoses and treatment of professional medical personnel in medical institutions, i.e. a medical institution providing inquiries, diagnoses, and treatment for the public under the considerations of needs or demands. Fernandez et al. (2016) regarded medical service as to help people, when losing health or feeling uncomfortable, get rid of illnesses and recover the health (Lindson-Hawley et al. 2015). The major factor in the medical ecology use of the aged was the health conditions that the better health conditions would reduce medical ecology use. According to the medical conditions in the USA, Asp et al. (2017) defined medical ecology use as the actually consumed medical resources when needs became medical treatment. Morgan et al. (2015) defined it as an individual, when suffering from illnesses or seeking for preventive health care, receiving professional medical personnel's diagnoses and treatment in medical sites. Accordingly, medical ecology use was the result of people taking actions for the physiological or psychological desires for medical service.

Referring to Tong et al. (2018), the measuring dimensions for medical ecology use are described as below.

- (1) Outpatient visits: outpatient visits of studied objects (including Chinese traditional medicine, western medicine, and dental outpatient use).

(2) Hospitalization days: the sum of days for acute beds and days for chronic beds of studied objects.

Research Hypothesis

Zhang et al. (2017) indicated that changing life habits (e.g. not smoking and taking exercise) could enhance individual health and reduce medical expenses. Hoover et al. (2015) also pointed out the effect of marital conditions on medical resource use. The higher age appeared the higher medical ecology use; the higher education showed the lower medical ecology use; ones with spouse revealed higher medical use than those without spouse; and, ones living in urban areas presented lower medical use than those living in rural areas (Tan et al. 2016). Bahreynian et al. (2017) pointed out the remarkable correlations between health hazard behavior and medical use of hospitalization and outpatient. According to lifestyles, Xiao et al. (2016) divided the research objects into low, medium, and high health risks, and the factors in health risks covering smoking, activity, drinking, and blood pressure. The research found out the lower health risks, the lower medical expenses that the reduction of health risks could reduce medical expenses. Drope et al. (2018) discussed the effect of health-related behavior on hospitalization use of the middle-aged and aged diabetes patients in Taiwan and discovered that patients with more health-related behavior would reduce hospitalization use. Regarding the correlations between leisure exercise and medical use of the aged in Taiwan, Yokokawa et al. (2015) revealed that ones with high weekly exercise appeared lower medical use of hospitalization, total medical expenses for hospitalization, and total medical expenses in the following year than those not doing exercise; and, the age and education of the research objects were related to the medical use. Patel and Dowse (2015) found out the less health hazard, the higher outpatient use and hospitalization use and the more health promotion, the higher outpatient use of western medicine. Aiming at the effect of health-related behavior changes on health conditions of the middle-aged and aged people, Tead et al. (2016) revealed that hospitalization use was the key factor in suffering from common chronic illnesses. Accordingly, the following hypotheses are proposed in this study.

H1: Health promotion behavior presents notably negative effects on outpatient visits.

H2: Health promotion behavior shows significantly negative effects on hospitalization days.

H3: Health hazard behavior reveals remarkably positive effects on outpatient visits.

H4: Health hazard behavior appears significantly negative effects on hospitalization days.

SAMPEL AND MEASURING INDICATOR

Research Sample and Object

Aiming at the aged group in Shanghai, 500 copies of questionnaire are distributed, and 396 valid copies are retrieved, with the retrieval rate 79%.

Reliability and Validity Test

The questionnaire items in this study are referred to domestic and international researchers that the questionnaire should present certain content validity. The dimensions of health promotion behavior and health hazard behavior are tested the overall structural causality, and the linear structural relation model analysis results reveal the overall model fit achieving the reasonable range that it should present favorable convergent validity and predictive validity. Item to total correlation coefficients are utilized in this study for testing the construct validity of the questionnaire content, i.e. reliability analysis, and the acquired item to total correlation coefficients are applied to judge the questionnaire content. The item to total correlation coefficients of the dimensions in this study are higher than 0.7, showing certain construct validity of the dimensions of the questionnaire.

To further understand the reliability of the questionnaire, reliability analysis is further preceded in this study. According to the standards to develop the formal questionnaire, the measured Cronbach's α appears in 0.70~0.90, apparently conforming to the reliability range.

EMPIRICAL RESULT ANALYSIS

Evaluation Index of LISREL Model

LISREL (linear structural relation) model, integrating factor analysis and path analysis in traditional statistics and adding simultaneous equations in econometrics, could calculate multi-factor and multi-causal paths at the same time. The model fit could be evaluated from preliminary fit criteria, overall model fit, and fit of the internal structure of model.

The research data are organized as below. The preliminary fit, internal fit, and overall fit of the model are explained as followings.

From the complete model analysis result, **Table 1**, 4 dimensions of health promotion behavior (exercise,

Table 1. Overall linear structural model analysis result

evaluation item	parameter/evaluation standard	result	t	
preliminary fit	health promotion behavior	exercise	0.702	9.45**
		diet pattern	0.713	10.12**
		weight control	0.723	10.36**
		life adjustment	0.731	10.97**
	health hazard behavior	harmful behavior	0.784	14.15**
		harmful habit	0.775	13.44**
harmful diet		0.766	12.69**	

Note: * stands for $p < 0.05$, ** for $p < 0.01$, and *** for $p < 0.001$

Table 2. Overall linear structural model analysis result

evaluation item	parameter/evaluation standard	result	t
internal fit	health promotion behavior→outpatient visits	-0.823	-25.87**
	health promotion behavior→hospitalization days	-0.816	-24.13**
	health hazard behavior→outpatient visits	0.804	22.75**
	health hazard behavior→hospitalization days	-0.846	-28.51**

Note: * stands for $p < 0.05$, ** for $p < 0.01$, and *** for $p < 0.001$

Table 3. Overall linear structural model analysis result

overall fit	χ^2/Df	1.638
	GFI	0.975
	AGFI	0.933
	RMR	0.005

Note: * stands for $p < 0.05$, ** for $p < 0.01$, and *** for $p < 0.001$

diet pattern, weight control, and life adjustment) could remarkably explain health promotion behavior ($t > 1.96$, $p < 0.05$), and 3 dimensions of health hazard behavior (harmful behavior, harmful habit, and harmful diet) could notably explain health hazard behavior ($t > 1.96$, $p < 0.05$). Apparently, the overall model in this study presents good preliminary fit.

From **Table 2**, health promotion behavior shows negative and significant correlations with outpatient visits (-0.823, $p < 0.01$) that H1 is supported. Health promotion behavior also reveals negative and remarkable correlations with hospitalization days (-0.816, $p < 0.01$) that H2 is supported. Health hazard behavior appears positive and notable correlations with outpatient visits (0.804, $p < 0.01$) that H3 is supported. Moreover, health hazard behavior presents negative and significant correlations with hospitalization days (-0.846, $p < 0.01$) that H4 is supported.

From **Table 3**, the overall model fit standards $\chi^2/Df=1.638$, smaller than the standard 3, and $RMR=0.005$ show the proper results of χ^2/DF and RMR. Furthermore, chi-square value is sensitive to samples size that it is not suitable for directly judging the fit. However, the overall model fit standards $GFI=0.975$ and $AGFI=0.933$ reach the standard 0.9 (the closer GFI and AGFI to 1 revealing the better model fit) that this model presents good fit indices.

CONCLUSION

From the research results, the medical ecology use of hospitalization is better correlated with health promotion behavior, while outpatient is correlated with health hazard behavior. Along with more health promotion programs, hospitalization days and total medical expenses for hospitalization are decreasing. Such a result is similar to the research reports of the lower health risks, the lower medical expenses and the more health-related behavior of patients, the less hospitalization use. It is therefore inferred in this study that the more health promotion behavior might largely reduce medical ecology use of hospitalization. The more health hazard behavior also reduces hospitalization days possibly because the medical use of hospitalization is generally the patients with more serious illnesses, while the aged with more hazards might be death to result in reducing hospitalization days. However, the medical ecology use of outpatient appears irregular changes. It is assumed that those with health hazards might stress less on the health as the effect of health-related behavior is not immediate to result in reducing visits. Such a result is worth of deeper discussions.

RECOMMENDATIONS

By organizing the research results and findings, practical suggestions aiming at the research results are proposed as below.

1. In regard to hospital management, medical institutions are suggested moving towards the encouragement of preventive medicine so that patients could be healthy and hospitals could benefit from health. It could remarkably improve the overuse of medical resources. Adding the preventive medicine indicator to the excellence indicators of hospitals could provide adequate incentives for medical institutions doing preventive medicine well.
2. Medical institutions are suggested moving towards the enhancement of the public health promotion behavior in order to enhance the public quality of life by providing health education of health promotion behavior for the aged in communities and teaching the aged about self-care health knowledge of chronic illness. Distinct health-related behavior promotion could be designed to encourage the public participating in health promotion activity and maintaining the health promotion behavior

as well as to guide them to quit bad health hazard behavior.

3. In addition to self-cognition, the aged are also stimulated by action clues to adopt health-related behavior. The so-called action clues refer to external environmental factors, such as mass media, others' advice, health care personnel's reminding, and friends' illness experiences. It is therefore suggested that health care personnel could provide health education and improve bad

lifestyles and behaviors of the aged when they visiting medical institutions so as to effectively control the sickness and delay the probability of complications.

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