

Does Using the Internet Make Older People Physically and Mentally Healthy?

—Empirical Research from (CGSS2015) Data

Peiyuan Li^{1*}

¹ Nankai University (Alt+L)

*Corresponding author. Email: 13518464447@163.com(Alt+C)

ABSTRACT

With the transformation of economy and society, the age structure of our country's population is showing drastic changes. The aging of the population and the development direction of the aging that follow are considered to be the important characteristics of my country's demographic transition. The health and elderly care issues of the elderly have become a major issue of concern to our society and related to the overall situation of national development. This article uses microdata from the 2015 China General Social Survey (CGSS), selects an ordered logistic model to analyze the data, and explores the impact of the use of the Internet on the mental health of older people to analyze whether different Internet use has affected the physical and mental health of the elderly. The results are tested for robustness using propensity score matching (PSM). Studies show that the elderly using the Internet are 18.8% and 33% more physically and mentally healthy than those not using the Internet.

Keywords: Internet use, elderly, mental health, physical health, active ageing

1. INTRODUCTION

With the transformation of economy and society, the age structure of our country's population is showing drastic changes. The aging of the population and the development direction of aging that followed are considered to be the important characteristics of my country's demographic transition^[1]. According to the UN's classification criteria for population aging, a country or region with more than 7% of the elderly population over the age of 60 to the total population means that the country or region is aging. According to my country's census data, the proportion of the elderly over 60 years old in my country's population reached 6.13%, 7.62%, 8.57%, 10.33%, and 13.26%, respectively, and the proportions continue to rise. Both the growth rate and the proportion of the elderly population in my country have exceeded the global average. The "silver hair wave" is rolling in. The health and elderly care issues of the elderly have become a major issue of social concern and related to the overall development of the country.

At the same time, since the 1990s, the Internet has developed rapidly in my country and has become a new driving force for my country's economic development.

While the Internet is helping economic development, it is also subtly changing the way people live, study and work, and greatly enrich and expand people's daily life^[2]. As the health and problems of the elderly are getting more and more attention from society and the country, my country will promote the implementation of a healthy aging strategy, which is an important strategic direction for building a healthy China and a long-term solution to actively respond to the aging of the population. This article starts with the physical and mental health of the elderly, trying to sort out the potential impact mechanism of the use of the Internet on the physical and mental health of the elderly, using the micro-survey data of the China Comprehensive Survey (CGSS) in 2015 to conduct an empirical analysis, and the research content is in "healthy aging" against the background of the "Internet age", and it has distinct characteristics and practical significance of the times.

2. METHODS AND MATERIALS

The data used in this article comes from the 2015 China Comprehensive Social Survey (CGSS) project carried out by the Survey and Data Center of Renmin University of China. The survey takes all urban and rural households in 31 provinces, autonomous regions, and

municipalities (excluding Hong Kong, Macao and Taiwan) as the survey target population, which is fairly representative. The research object of this paper is the elderly over 60 years old. After excluding samples with missing values, 2787 valid samples are obtained.

The research content focuses on the impact of Internet use on the physical and mental health of the elderly. Taking into account the synchronization of data and physical health, this article uses the CGSS2015 questionnaire question, "During the past four weeks, how often did your work or other daily activities be affected by health?" as the explained variable to measure the level of physical health. In terms of mental health, this article selects the questionnaire question, "During the past four weeks, how often did you feel bad mood?" as the explained variable to measure the level of mental health.

Table 1. Variable definitions

Dimension	variable	Variable interpretation
Dependent variable	Physical health	Very unhealthy=1, relatively unhealthy=2, general=3, relatively healthy=4, very healthy=5
	Mental health	Very unhealthy=1, relatively unhealthy=2, general=3, relatively healthy=4, very healthy=5
Internet use	Internet use	Yes=1, No=0
	Intensity of use	Never=1, rarely=2, sometimes=3, often=4, very frequently=5
	Information Sources	Yes=1, No=0
	Leisure internet use	Never=1, several times a year or less=2, several times a week=3, several times a month=4, every day=5
Leisure preference	Social activities	Never=1, rarely=2, sometimes=3, often=4, very frequently=5
	Entertainment	Never=1, rarely=2, sometimes=3, often=4, very frequently=5
	Learning activity	Never=1, rarely=2, sometimes=3, often=4, very frequently=5

3. MATH AND EQUATIONS

In order to observe how and to what extent the use of the Internet affects the physical and mental health of the elderly, this paper constructs an empirical model to perform regression analysis on the cross-sectional data of the impact of Internet use on the health of the elderly in 2015. In the selection process of the model, since the explained variables of "physical health" and "mental health" measured in this article are ordered categorical variables, based on previous literature research^[3], an ordered logistic regression model was selected to construct The basic model is as follows:

$$P(y=j|x_i) = \frac{1}{1+e^{-(\alpha+\beta x_i)}} \quad (1)$$

In formula (1), x_i represents the i -th index, and y is the actual observation value, which are assigned values of 1, 2, 3, 4, and 5 respectively. There is a clear order and represents the probability of the elderly in different health conditions. In the ordered logistic model, an internal trend variable y^* of the observed phenomenon is introduced, which satisfies the following form:

$$y^* = AX + \xi_i \quad (2)$$

In formula (2), X is the explanatory variable, A is the parameter vector to be estimated, and ξ_i is the error term. After obtaining the parameter estimates of ξ_i and A , the cumulative probability of each value can be obtained by the following equation:

$$P(y \leq j|X) = \frac{e^{-(\alpha+\beta x_i)}}{1+e^{-(\alpha+\beta x_i)}} \quad (3)$$

4. FIGURES AND TABLES

4.1. Whether the use of the Internet affects the physical and mental health of the elderly

This paper uses regression models to study the impact of whether or not elderly people with different sample characteristics use the Internet on their physical and mental health. Models 1 and 1a are the regression results of all sample data; models 2 and 2a are the regression results of the elderly with urban household registration as the research object; models 3 and 3a are the regression results of the rural elderly as the research object; models 4 and 4a are The regression results of the male elderly as the research object; Models 5 and 5a are the regression results of the female elderly as the research object.

According to Table 3, the regression results of all sample data show that the regression coefficient of Internet use on the physical health of the elderly is 0.188, which is significant at the 10% level, and the regression coefficient for the mental health of the elderly is 0.330, which is significant at the 1% level. This shows that the physical health and mental health of the elderly who use the Internet are 18.8% and 33.0% higher than that of the elderly who do not use the Internet. Internet use has had

a positive impact. The urban and rural samples show that Internet use has a significant positive impact on the mental health of the elderly with urban household registration at the level of 5%, but has no significant impact on their physical health, and has no positive impact on the physical and mental health of the elderly with rural household registration. The underlying influence mechanism may be that urban elderly people have relatively superior economic and living conditions. The probability of sedentary work during work is higher and the amount of exercise is insufficient^[4]. Therefore, they may continue to use static Internet activities in their old age, which may not be physiological Health has a positive impact. As for the rural elderly, due to the large differences in the development of my country's urban and rural areas, the proportion of rural elderly who can use the Internet is relatively low. Therefore, the use of the Internet has not had a significant positive impact on the

rural elderly with household registration. The gender sample shows that Internet use has a significant positive effect on the mental health of male elderly people at the level of 1%, but does not have a significant positive effect on physical health. At the same time, Internet use has not had a significant positive effect on the physical and mental health of elderly women. The possible impact mechanism is that women's economic and educational levels are lower than men of the same age group, and they are less likely to be able to use the Internet in old age than men^[5]; at the same time, women will be more idle than men in old age. The proportion of time investment in family labor and care is higher, and the source of satisfaction may be family and intergenerational care. At the same time, there is not much time invested in the use of the Internet, so the use of the Internet cannot bring it Significant positive impact.

Table 2. Regression results of whether to use the Internet on the physical and mental health of the elderly

variable	Full sample		City sample		Rural sample		Male sample		Female sample	
	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a	Model 5	Model 5a
Internet use	0.188*	0.330***	0.162	0.257**	0.253	0.440	0.189	0.471***	0.186	0.161
age	-0.019***	-0.04	-0.024***	-0.017***	-0.012	0.020**	-0.027***	-0.018**	-0.016**	0.007
marital status	-0.203**	-0.03	-0.151	0.176	-0.245*	-0.223*	-0.275**	0.121	-0.093	-0.021
education level	-0.984	0.076***	-0.836	0.069***	0.075*	-0.269	-1.046	0.087***	0.047*	0.067**
political status	0.220**	0.324***	0.243**	0.376***	0.286	0.291	0.243**	0.296**	0.173	0.491**

5. ROBUSTNESS TEST-REDUCE THE IMPACT OF ENDOGENOUS INTERNET USE ON THE PHYSICAL AND MENTAL HEALTH OF THE ELDERLY

Because older people with healthier physical and mental health may have more physical and psychological foundations for social, entertainment, and learning activities, and are more inclined to use the Internet, the previous empirical model may have endogenous problems, which makes the measurement regression results inaccurate. In order to test whether the influence effect obtained in the previous article is robust, this paper takes physiological health as an example, refers to previous studies, uses propensity score matching method to test the relationship between Internet use and the health of the elderly, and compares with the previous results^[6]. This article defines the sample that uses the Internet as the treatment group, and the sample that does not use the Internet as the control group.

standardized deviation distribution of the variables is relatively scattered before matching, and concentrated near 0 after matching, indicating that it is reasonable to use this method to control endogeneity.

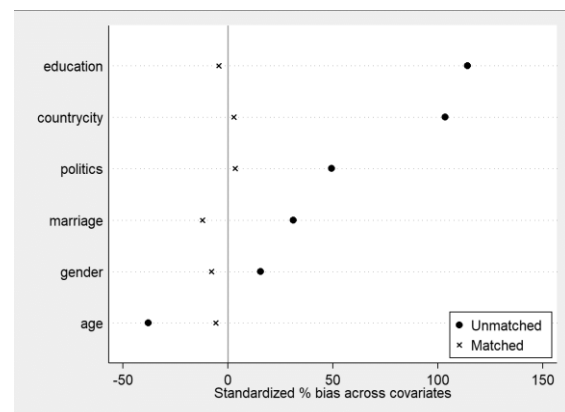


Figure 1 Changes in the standardization deviation of each variable

It can be seen from Figure 1 that after matching, the standardization deviation is significantly reduced. The

6. CONCLUSION

Through empirical analysis, the following research conclusions are obtained: The use of the Internet by the elderly can significantly improve their physical and mental health, and their physical health and mental health have increased by 18.8% and 33% respectively compared with the elderly who do not use the Internet. In terms of urban-rural differences, the use of the Internet by the elderly with urban household registration has a positive impact on their mental health, while the elderly with rural household registration did not have a significant positive impact. In terms of gender differences, the use of the Internet by male elderly people has a positive effect on their mental health, while the use of the Internet by female elderly people does not have a significant positive effect on their physical and mental health. Using the intensity of Internet usage for stability test, regression also got similar results.

This article starts with the physical and mental health of the elderly, and successfully sorts out the impact of Internet use on the physical and mental health of the elderly.

With the active advancement of "healthy ageing", how the elderly can age actively and healthily has become a topic of concern for individuals, society and the country. At the same time, with the further development of the Internet in our country and the deepening of aging, the Internet will increasingly penetrate into the lives of the elderly. Therefore, based on the above analysis results, this article puts forward the following suggestions:

First, lower the threshold for the elderly to use the Internet and increase the proportion of the elderly who use the Internet. On the one hand, it is possible to lower the threshold of Internet use from the perspective of reducing tariffs, so that the elderly will not have a large financial burden in the process of using the Internet; on the other hand, it can be carried out through diversified entities such as family members, volunteers, and communities. Related Internet use operation training to help the elderly master basic Internet use skills.

Second, speed up the construction of Internet infrastructure and speed up the development of the Internet in rural areas. Due to the long-term imbalance of urban and rural development in my country, and the imbalance between regional development, Internet construction resources should be tilted to underdeveloped areas, and basic Internet infrastructure construction between regions should be balanced, and the elderly in underdeveloped areas should be able to access the Internet.

Third, in view of the different health effects of different Internet usage preferences on the elderly, we can consider establishing a community-based organization for the establishment of a cultural society

for the elderly to use the Internet, and to further understand the various functions of the Internet through communication between the elderly and enrich them. Elderly life promotes physical and mental health.

Fourth, in the direction of future development, we can consider using the Internet to manage the physical condition of the elderly with big data, to grasp the physical condition of the elderly in a timely manner, to promote the breakthrough of the elderly medical insurance dilemma, and to help the elderly achieve active aging in all aspects.

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