PEOPLE: International Journal of Social Sciences
ISSN 2454-5899

Yizhe, Chen, 2019

Volume 5 Issue 2, pp. 212-221

Date of Publication: 19th August 2019

DOI-https://dx.doi.org/10.20319/pijss.2019.52.212221

This paper can be cited as: Chen, Y., (2019). Can Use of Internet Help to Relieve Depression? PEOPLE: International Journal of Social Sciences, 5(2), 212-221.

CAN THE INTERNET HELP RELIEVE DEPRESSION?

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Abstract

Depression is a very serious problem in our modern society. It can influence people negatively in many ways. Although many scientists are trying to find efficient ways to deal with depression, there are still no final conclusions. Using data from the China Health and Retirement Longitudinal Study (CHARLS), this study shows that in China, internet use among older people (aged 45 and above) helps relieve their depression symptoms. Combining this finding with steadily growing cellphone use, this suggests that developing specially APPs for older people to use smart phones can help combat depression in China. Other ways to reach the rural population via the internet can also be powerful tools to help with depression.

Keywords

Internet Use, Depression, Older People, Health, Welfare, Well-Being

1. Introduction

Depression is a common and serious medical illness that afflicts people around the world, and it negatively affects how we feel, how we think and how we act. When people experience outbreaks of depression, they may feel a deep level of sadness and may lose interest in activities. As a result, it can reduce one's ability to function, both at work and at home.

Depression is widely spread. According to the World Health Organization (WHO), by March 2018, an estimated 300 million people were affected by some level of it. That is almost 4.4%

of the global population. It is the leading cause of disability worldwide, and is a major contributor to the overall global burden of diseases. WHO predicted that by the year 2020, depression will become the second largest in global disease burdens and will become one of the priority conditions covered by the WHO's Mental Health Gap Action Program (Andresen, 1994).

In China, according to WHO, more than 54 million people (4.2% of the population) currently suffer from depression. Another study from Chinese Academy of Sciences and Haola Technology shows that almost 90 million Chinese are suffering from it (Cheng, 2016). The number of people with depression in China is alarming, and it is important to understand what we can do to help people. Of them, my research interest focuses on people who are 45 years old or older. They have made a great contribution to China over the past three decades, in their prime years, and they experienced the biggest economic reform in China. The reform brought opportunities but also was a social shock. While sustaining the shock, this age group also needed to work hard to fulfill the economic growth. It is now obvious that this group of people could have accumulated psychological problems and developed depression. However, they had very little counseling support either due to lack of awareness of their mental health needs or a cultural habit "to endure in silence".

That makes studying how we can help these people handle their depression even more important. This paper mainly focuses on the potential of Internet use in influencing Chinese depression in the age group of 45 and above. My hypothesis is that internet use may help to reduce depression in older people since it is an alternative way of socializing and connecting with others.

2. Literature Review

Typical factors influencing the prevalence of depression include gender, stressful life events, and physical health problems (Qian, 2017). Gender is one of the most widely known factors of depression. According to Nancy Schimelpfening, administrator for the non-profit depression support group Depression Sanctuary, depression is two times more common in women than in men mainly because of female sex hormones (Radloff, 1977). Estrogen and progesterone have been shown to affect neurotransmitter, neuroendocrine, and circadian systems that have been implicated in mood disorders. Another reason is that women often undergo mood disorders associated with their menstrual cycle, such as premenstrual dysphoric disorder. In addition, the hormonal fluctuations associated with childbirth are a common trigger for mood disorders. Although menopause is a time when a woman's risk of depression declines, the premenopausal period is a

time of increased risk for those with a history of major depression. Some other reasons related to gender may be the differences in reactions to problems and social roles.

Apart from gender, stressful life events may be another significant factor. Stressful life events such as failing important examinations can easily overwhelm people's abilities to cope, which may subsequently cause depression. Scientists have suspected that high levels of the hormone cortisol, which is secreted during periods of stress, may affect the neurotransmitter serotonin and contribute to depression.

Furthermore, mental health issues can also be the result of one's physical health problems. For some people, the stress of having a chronic illness may trigger an episode of major depression. For others, certain illnesses, such as thyroid disorders, Addison's disease, and liver disease, can cause depression symptoms.

The focus group of this study, being older and most likely more stressed than other generations, doesn't have a clear profile of whether they have a low risk or high risk of depression. Using internet usage to socialize with others, this study aims to unveil whether the internet will lessen the instances of depression in this group.

3. Data and Methodology

In this study, three datasets are used, and all of them are from the China Health and Retirement Longitudinal Study (CHARLS). CHARLS is a follow up study of a national representative sample of Chinese residents ages 45 and older. The baseline wave 1 survey was conducted in 2011 and included about 10,000 households and 17,500 individuals nationwide. These individuals were then followed up on every two years.

Among the three datasets, the first and second one is from 2015 CHARLS Wave4 - Demographic Background and Health Status and Functioning. The third dataset is from 2014 CHARLS Wave3 - Education History, which was used solely to retrieve education background information. The information was joined by the respondents' identifiers to ensure the integrity of the data. Prevalence of depression and the usage of the internet were described and their association was examined while considering other factors, including age, gender, educational level, marital status, and Hukou status (Cheng, 2016). The analysis included those aged 45 years and above. Participants with missing data on variables of interest were eliminated from this analysis. As a result, the final analysis included 16,386 participants.

For Internet use, CHARLS included three questions. The first question was, "Have you done any of these activities in the last month? (Select all that apply)" with the following response options:

a) Used the Internet
b) Attended a sport event, social club, or other club
c) Played Ma-jong, played chess, played cards, or frequented a community club
d) Attended an educational or training course.

If "Used the Internet" was selected, participants were further asked: "Which tools did you use to access the internet?" with the following options:

a) Desktop computer
b) Laptop computer
c) Tablet computer
d) Cellphone
e) Other devices.

Internet frequenters who used internet in the last month were asked, with the following options:

a) Almost Daily
b) Almost Every Week
c) Not Regularly

For depression, CHARLS used the ten-question version of the Center for Epidemiologic Studies-Depression scale (CES-D) to assess depressive symptoms, as was used by Andresen, Malgren et al (1994). The questions have a 0-3 scoring scale, as shown in the table below. The total score for one respondent will be between 0-30, with a higher score indicating higher level of depressive symptoms.

Table 1: *Depression Score*

Frequency	**Score**
Rarely (< 1 day)	0
Some or few times (1-2 days)	1
Occasionally (3-4 days)	2
Most or all the time (5-7 days)	3

In this study, participants are categorized as "having depression" if their scores are ≥ 10 while as "no depression" if their scores are below 10 (Boey, 1999). The use of CES-D was also been previously tested and validated among elderly respondents in China (Wei, 2018).

Other variables include age, gender, educational level, marital status, and Hukou status. Age is a continuous variable, while gender is categorical, with 0 as male and 1 as female. Education levels are grouped into four: 0='illiterate', 1='primary school education or below', 2='middle school to 3-yr college education', and 3='4-yr college education or above'. Marital status has two categories, with 0 for "married/cohabitating", and 1 for "separated/Divorced/Widowed/never married". Hukou, the national household registration, is used to proxy the living environment because it is connected to social welfare programs provided by the government, which assigns benefits based on rural and urban status.

4. Data and Methodology

Descriptive statistics are used to summarize the data. The usage of the Internet, including its prevalence, types of tools, and frequency, is described using proportions. For depression, the average score of depressive symptoms and prevalence of it are described using means and proportions.

Chi-square (Chi-sq) test was performed to check for different proportions of depression among people who use the internet and among those who do not use the internet. It is a test for examining the relationship between two categorical variables. I use 0.05 as statistical significance level. This means that if the P-value from chi-sq test is less than 0.05, there is a statistically significant relationship between internet use and depression.

Then we used the Logistic Regression Model to analyze the effect of internet usage on depression while considering other factors mentioned earlier. The main output from Logistic Regression included regression coefficients b, and Odds Ratio (OR). OR can be used to infer the impact of each factor. Since it is a ratio, we can infer a variable's impact by comparing the ratio to 1. If the OR is lower than 1, we can say that the increase in the variable corresponds to the event happening less. For example, if internet use has an OR lower than 1, it means by changing from not using internet (value 0) to using internet (value 1), the odds of getting depression gets lower. We also use a 0.05 threshold to determine if the factor is significantly impacting the occurrence of depression.

5. Result

Among 16,386 participants, the average depressive score was 9.0. Using 10 as cutoff point, it was found that 6,340 (38.7%) were identified as having depression. This is much higher than the WHO reported 4.2% overall depression rate in China. This is because depression tends to happen more often as people age and the CHARLS survey was following older people as its target.

Overall, the use of the internet is relatively rare for mid- to old age Chinese of 45 years and above. Only 6.46% of the study participants reported that they had used the internet in the last month. However, if they use the internet, they would use it very frequently. Among these internet users, 74% used it "Almost Daily"; 11% used it "Almost Every Week", and 15% used it "Not Regularly".

Table 2: *Internet Use Frequency if Used Last Month*

Internet Use	**Percent**
Not Regularly	15%
Almost Every Week	11%
Almost Daily	74%

Of the internet users, the cellphone is the most popular device, followed by the desktop. Since multiple choices could be chosen for this question, the total doesn't add up to 100%. The cellphone usage is not surprising, considering the cost effective and widely available data plans all over China from different providers.

Table 3: *Devices used to Access Internet*

Devices to Access Internet	**Percent**
Desktop computer	60%
Laptop	18%
Tablet	12%
Cellphone	65%

5.1 Comparing Depression Rate by Internet Use Using Chisq Test

To begin, we found that the proportion of depression among participants who used the internet in the last month (28.7%) was lower than that among those who did not (39.5%). This is consistent with the hypothesis that internet use helps to reduce depression since it is an alternative

way of connecting with others. The Chisq test generated a P-value of <0.0001, meaning that the difference between these two proportions are statistically significant.

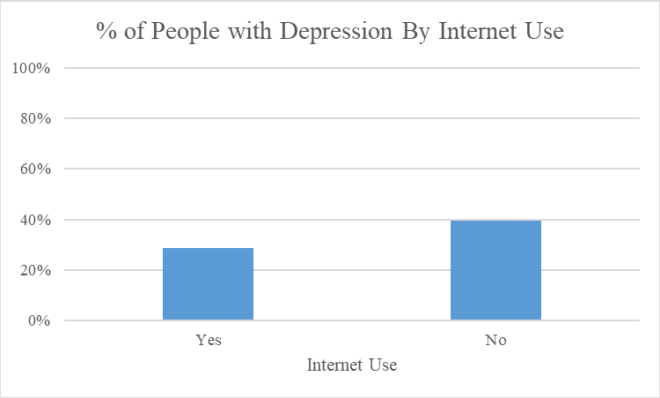

Figure 1: *Depression Rate by Internet Use*

5.2 Analysis Results from Logistic Regression Model of Depression and Factors

However, both the descriptive comparison and the Chisq test didn't consider other factors influencing depression rates. In order to control for the other factors, we used a Logistic Regression Model, which results were presented in Table 4 below. Each variable's impact of odds ratio, abbreviated as OR, of experiencing depression was presented in Table 5 below. In the logistic regression analysis, five additional variables were included to adjust for potential confounding effects, including age, gender, marital status, education, and Hukou.

Results showed that the Internet use was related to a lower (76%) likelihood of having depression. Meanwhile, women (gender=2) were 1.66 times more likely to be depressed than men. Marital status was also related to depression status, with those "separated, Divorced, Widowed, or never married" 1.28 times more likely to be depressed than those married or cohabitating, or for education is 0.86, meaning that higher education is associated with lower likelihood of depression. Lastly, Hukou is related to depression. Compared with rural Hukou, people with urban Hukou were 0.76 times less likely to have depression. This may have to do with the easier access to community activities and other social support resources in the urban set up.

Table 4: *Coefficients from Logistic Regression Analysis*

	Estimate	**Std.**	**Error**	**Z value**	**Pr(>|z|)**
(Intercept)	-0.288	0.228	-1.263	0.207	
internet	-0.270	0.132	-2.052	0.040	*
age	-0.003	0.003	-0.791	0.429	
gender	0.506	0.062	8.205	0.000	***
marital status	0.247	0.094	2.616	0.009	**
education	-0.150	0.046	-3.272	0.001	**
urban	-0.268	0.088	-3.055	0.002	**

Significance: 0: *** 0.001: ** 0.05: *

Table 5: *Odds Ratios from Logistic Regression Analysis*

	Odds Ratio	**Lower Bound (2.50%)**	**Upper Bound (97.50%)**
(Intercept)	0.750	0.479	1.172
internet	0.763	0.587	0.985
age	0.997	0.991	1.004
gender	1.659	1.470	1.872
marital status	1.280	1.064	1.540
education	0.861	0.787	0.942
urban	0.765	0.643	0.908

6. Discussion

I found that 38.7% of the study sample had depression. This is consistent with the prevalence of 40% from the baseline survey of CHARLS, reported by the CHARLS Research Team (14). However, this is an alarmingly high rate, as a significant share of the elderly was suffering from depressive symptoms" [6]. Over the past few decades, there has been an increasing phenomenon of the "empty-nest" in China. It means that in many Chinese families, children live and work away from their original townships, leaving behind a huge number of older adults living alone. The mental health of these middle-aged and elder people living by themselves has been of

serious concern. Studies have shown that a majority of them experience some level of loneliness, especially among those living in rural areas (Wang, 2011).

The finding of this study that internet use can help reduce depression rate is good news and can shed light on future activities to help older people. Previous research has studied the mechanism of how positive social networking is protective against depression and anxiety (Seabrook, 2016). By enabling middle-aged and senior people to reconnect with their friends, children, and colleagues, the use of the internet can augment social relationships and support mental health. It helps people make and maintain new friends, and also serves as a venue for them to express their thoughts and feelings. Therefore, this finding helps us to find a way to help this group of Chinese people.

This study found that 6.46% of Chinese middle-aged or older were internet users in the year 2015, and a majority (74%) of them used it almost daily. Cell Phone and desktop computers were the most common tools reported. According to more recent reports, there was an increasing trend of internet use in China over the past years (Wei, 2018). People aged 50 and older made up 7.9% of all internet users at the end of 2014, and in year 2018 this percentage increased to 10.4%. Therefore, in the span of three years, middle-aged and senior internet users increased from 51 million to 80 million.

Therefore, specially designed cell phone APPs can be a strong way to reach older people and help them to combat depression. We have many APPs for young people in APP STORE, but few for elder people. The agencies should develop APPs that can encourage older people to communicate with others, no matter online or offline. Special games can also be invented to encourage older people to express themselves and ‘step out’ of their cloistered rooms, either physically or mentally.

References

Andresen, E. M., Malmgren, J. A., Carter, W. B., & Patrick, D. L. (1994). Screening for depression in well older adults: evaluation of a short form of the ces-d (center for epidemiologic studies depression scale). American Journal of Preventive Medicine, 10(2), 77-84. https://doi.org/10.1016/S0749-3797(18)30622-6

Boey, K. W. (1999). Cross-validation of a short form of the ces-d in chinese elderly. International Journal of Geriatric Psychiatry, 14(8), 608-617. https://doi.org/10.1002/(SICI)1099-1166(199908)14:8<608::AID-GPS991>3.0.CO;2-Z

Cheng, H. G., Chen, S., Mcbride, O., & Phillips, M. R. (2016). Prospective relationship of depressive symptoms, drinking, and tobacco smoking among middle-aged and elderly community-dwelling adults: results from the china health and retirement longitudinal study (CHARLS). Journal of Affective Disorders, 195, 136-143. https://doi.org/10.1016/j.jad.2016.02.023

Qian, J., Li, N., & Ren, X. (2017). Obesity and depressive symptoms among chinese people aged 45 and over. Scientific Reports, 7, 45637. https://doi.org/10.1038/srep45637

Radloff, L. S. (1977). The ces-d scale a self-report depression scale for research in the general population. Applied Psychological Measurement, 1(3), 385-401. https://doi.org/10.1177/014662167700100306

Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). Social networking sites, depression, and anxiety: a systematic review. Jmir Mental Health, 3(4), 1-50. https://doi.org/10.2196/mental.5842

Wang G. Y., Zhang X. J., Wang K., et al. (2011). Loneliness among the rural older people in anhui, china: prevalence and associated factors. Int J Geriatr Psychiatry, 26(11), 1162-1168. https://doi.org/10.1002/gps.2656

Wei X. (2018, March 23). China's aging and senior community are finding comfort, entertainment and even fame from their smart devices. Global Times. Retrieved August 13, 2019, from http://www.globaltimes.cn/content/1094961.shtml.