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Internet Usage and Its Impact on The Physical and Mental Health of The Elderly in China

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ABSTRACT

This study examines the relationship between internet usage and the mental and physical health of elderly individuals in China using data from the 2021 China General Social Survey (CGSS). Employing an ordered logistic regression model, the research explores how internet usage influences the health of the elderly. The findings reveal a significant positive correlation between internet use and health outcomes of the elderly population. Elderly internet users demonstrate 10.8% and 6.7% higher physiological and mental health compared to non-users. However, using the internet as the primary information source significantly impairs physical health, while leisure-time internet use also negatively affects health. Moreover, the health impacts vary by demographic characteristics – married, male, more educated, and Communist Party member elderly benefit more. Overall, internet use can elevate the health levels of older adults but negative effects also exist. It is necessary to balance usage time and implement tailored interventions to promote the overall well-being of the elderly. Key recommendations include: advocating diversified internet use; promoting digital literacy; strengthening offline social connections. This research provides important insights into understanding the impacts of internet use on the health of the aging population in China, informing policies to improve their well-being in the digital age.

Keywords: Internet Use; Mental Health; Physical Health; Elderly Individuals

1. Introduction

The universally accepted and widely used definition for entering an aging society to date was established by the United Nations in 1956 and at the 1982 World Assembly on Aging. This definition states that a society is aging when the proportion of the population is aged 60 and overreaches 10.00%, or when the proportion of the population is aged 65 and more than 7.00%. China's population aging process has been notably faster than the global average and even faster than many developed countries. From 2000 to 2020, the elderly population aged 60 and above in China increased from 130 million to 260 million, marking a growth of 130 million people. This means that out of the global increase of 440 million elderly population during this period, China contributed 130 million people to that increase. According to the newest date,

Table1. Population Ageing in the World and China, 2000-2020

Category	Total Population	Population 60+	Proportion of 60+ Population

	(in billions)			(in billions)					
Year	2000	2010	2020	2000	2010	2020	2000	2010	2020
World	6.14	6.96	7.79	0.61	0.76	1.05	9.9	11.0	13.5
Developed Countries	1.19	1.23	1.27	0.23	0.27	0.33	19.5	21.8	25.7
Developing Countries (Excluding China)	3.64	4.32	5.05	0.25	0.32	0.47	6.8	7.5	9.2
China	1.26	1.34	1.42	0.13	0.18	0.26	10.0	13.3	18.7

(①UN, World Population Prospects,2019; ②Data for China are from the fifth, sixth, and seventh national census bulletins.)

According to the latest "World Health Statistics Report 2021" by the WHO, as of 2019, the overall life expectancy in China is 77.4 years (74.7 years for males and 80.5 years for females), and the healthy life expectancy is 68.5 years (67.2 years for males and 70.0 years for females) [1]. This indicates that although the average lifespan has been steadily increasing, the number of unhealthy days has also risen.

Meanwhile, as of December 2021, the number of internet users in China reached 1.032 billion, marking an increase of 42.96 million compared to December 2020 [2]. The internet penetration rate surged to 73.0%, up by 2.6 percentage points from December 2020. Amongst them, China's elderly Internet users aged 60 and above reached 119 million, accounting for 11.5% of the total number of Internet users, and the Internet penetration rate of the elderly population aged 60 and above reached 43.2% [3,4].

The proportion of middle-aged and elderly individuals using the internet is steadily increasing, and the impact of internet usage on their physical and mental health is gaining more attention. Therefore, understanding the effects of internet usage on the physical and mental health of elderly individuals holds significant importance in devising appropriate internet usage strategies and enhancing the health status of this demographic. This paper utilizes data from the China General Social Survey 2021 (CGSS) to explore the influence of internet usage on the health conditions of older adults, aiming to provide beneficial support and guidance for the health and quality of life of this population. Additionally, this research endeavors to drive the development of elderly care and internet health initiatives in our country.

2. Literature review

As the internet industry undergoes rapid development, its utilization among the elderly is increasingly prevalent. It has become a pivotal component in the lives of older individuals during their later years [5]. Notably, the internet serves as a platform for communication and knowledge acquisition, fostering an environment conducive to enhancing the health of older adults[6-8]. Research suggests that internet usage promotes active aging by positively influencing self-rated health, psychological well-being, and life satisfaction among the elderly [8]. Fotteler et al.(2023)

argue that with the aid of internet technology, older adults can access health and safety support while living independently.

Moreover, Hou et al. (2022) employed multiple regression modeling and identified a significant positive correlation between internet use and health status, with social participation mediating this relationship. Furthermore, disparities in the impact of internet use on health status were observed between older individuals residing in rural and urban areas. Internet usage has been found to facilitate access to health-related information on diet, exercise, and social interactions among older adults [11].

A study found that Internet use enables older adults to maintain close intergenerational relationships, which in turn promotes their subjective well-being [12]. Peng and Chan (2020) employed logistic regression as a baseline model and utilized propensity score weighting to assess the effects of internet use on exercise, dietary habits, betel nut chewing, smoking, and alcohol consumption among individuals aged 40 and over. Their findings indicate that regular internet users in this demographic are more inclined to adopt an overall healthier lifestyle.

However, contrary to the findings of previous studies, Internet use was not associated with a good lifestyle or higher self-rated health among older Polish people. The study also showed that older people who use the Internet and older people are less likely to utilize healthcare services [14].On the other hand, internet use during weekends has a more pronounced effect on reducing time spent with friends and family compared to internet use during weekdays[15]. Fang et al.(2019) conducted with a representative sample of 738 Chinese older adults aged 60 and above in the Hong Kong Special Administrative Region. The findings of the study suggest that increased use of information and communication technologies may be associated with poorer psychological adaptation among lonely older individuals. Day and Heimberg (2021) also support a correlation between Social Media Usage (SMU) and social anxiety, as well as feelings of loneliness.

Other factors that are important to the health of older people include age, marital status, education, mode of residence, social class, and so on [19–23] Therefore, this study added these factors as control variables to the model, along with separate interaction terms analyzing Internet use and gender, marital status, education, and being a party member.

This study intends to use the research data from the CGSS 2021 to examine the comprehensive impact of Internet use on the health of the elderly in terms of both physical health and psychological health and on this basis to analyze the impact of Internet use on the physical and mental health of the elderly, to provide data support for improving the health of the elderly in China and promoting the healthy development of the Internet.

3. Material and Methods

3.1 Material source

The Chinese General Social Survey (CGSS) was initiated in 2003 and represents China's first nationwide, comprehensive, and continuous large-scale social survey project. It serves as a representative of continuous cross-sectional social surveys in China. Through annual survey data, it aims to provide a comprehensive and systematic description and analysis of various aspects of Chinese society, including economics, politics, society, culture, etc. The project examines the development direction and trends at different levels, such as institutions, structures, behaviors,

and attitudes, while also shedding light on the changing relative positions, roles, and perceptions of social members and groups within Chinese society. Additionally, it describes and analyzes the actual conditions of social classes and various social groups [23].

In the year 2021, the CGSS conducted a nationwide survey with a total of 8,148 valid samples. The focus of this study is the elderly population aged 60 and above. After careful screening and exclusions, the study obtained 2,513 valid samples.

3.2 Variable Definition

In this research study, the dependent variable under consideration is the health status of the elderly population, comprising two primary dimensions: physical health and mental health. (1) Physical Health: This dimension serves as a direct indicator of the observable impact of health-related issues on the elderly population's ability to engage in work or daily activities. The primary variable for this aspect is extracted from the following questionnaire item: "To what extent have health problems affected your work or other daily activities in the past four weeks?"; (2) Psychological Health: This dimension pertains to the psychological and emotional well-being of the elderly. The key variable employed for measurement is derived from the following questionnaire item: "To what extent have you experienced feelings of depression or despondency over the past four weeks?". The responses to the three questions, with five categories " Very Unhealthy", " Rather Unhealthy" " Average", " Rather Healthy", and " Very Healthy", each assigned values within the range of 1 to 5. From Table 1, we can see that the elderly population tends to be relatively healthy, with an average mental health score of 3.854, and an average physical health score of 3.51.

The independent variable in this study pertains to internet usage, which will primarily be examined from three perspectives. (1) Internet Usage: The study utilizes the questionnaire item "In the past year, what has been your level of internet usage?" as the primary investigative indicator. (2) The internet as the primary source of information: The question "Is the internet your primary source of information? " is selected as the main measurement indicator. (3) Leisure-time Internet Usage: The study employs the survey item "In the past year, have you frequently used the internet during your free time?" as the main investigative indicator. Additionally, varying leisure-time preferences among individuals might lead to diverse impacts on the health of elderly individuals when using the internet during their free time. Elderly individuals primarily use the Internet to fulfill three major needs: social interaction, entertainment, and learning [25–27]. Therefore, this study selects three variables— "social activities," "leisure entertainment," and "learn activities"—to represent different preferences in leisure-time activities. From table 1, it's evident that the frequency of internet usage among elderly individuals is relatively high, about 42.8%, and during leisure time, the frequency of internet usage is higher, with a mean of 75.8%. However, using the internet as the main source is lower, only 22.76%. Simultaneously, there's a higher proportion of elderly individuals engaging in leisurely activities while a lower proportion engages in social interactions and learning during their free time.

The study selects age, gender, education level, marital status, income, household registration (hukou), political affiliation, and class as control variables. Considering these control variables, elderly individuals have an average age of 70 years, with the proportion of males at 50.34%. Educationally, most have completed education at or below the junior high school level. Income levels appear to be relatively low, with 74.53% of the elderly having a spouse. Additionally, 42.74% of the elderly come from urban areas, and only 16.39% are party members, indicating a relatively low percentage.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
physicalhe~h	2,513	3.547951	1.335525	1	5
mentalhealth	2,513	3.881019	1.143979	1	5
Independent variables					
internet	2,513	2.144449	1.552757	1	5
Source	2,513	.2276164	.4193771	0	1
Cyberleisure	2,513	3.735774	1.761287	1	5
Leisocial	2,513	2.561878	1.241312	1	5
Leirest	2,513	3.798249	.9751515	1	5
Lealrn	2,513	1.764425	1.13999	1	5
Control variables					
age	2,513	69.98766	6.72967	60	95
gender	2,513	.5033824	.5000881	0	1
edu	2,513	2.283327	1.898737	1	8
income	2,513	2.547951	.8031764	1	5
lnincome	2,513	1.238223	.2444616	.6931472	1.791759
married	2,513	.7453243	.4357655	0	1
hukou	2,513	.4273776	.4947963	0	1
Politics	2,513	.1639475	.3703016	0	1
class	2,513	3.329487	2.03602	0	9

3.3 Variable Definition

Given that the dependent variables in this study, namely, mental health, and physical health, are all ordinal categorical variables with values ranging from 1 to 5, an ordered logistic regression model is employed as the reference. The basic ordered logistic model is formulated as follows:

$$p(y = j / x_i) = \frac{1}{1 + \ell^{-(\alpha + \beta_{\chi_i})}} (1)$$

Equation (1), X_i represents the i-th indicator variable, y represents the dependent values, with values assigned as 1, 2, 3, 4, and 5, representing different health conditions of the elderly. In the ordered logistic model, a latent variable y* is introduced as an unobservable value representing the health status of the elderly, and y* is modeled as:

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

In Equation (2), X represents the independent variables, A is the parameter vector to be estimated and ε_i is the model intercept. Let y represent the critical boundary points for the unknown outcomes of the health status of the elderly, i.e., $y_1\ y_2\ y_3\ y_4$ which are four threshold points. After obtaining parameter estimates for ε_i and A, the probabilities for each value of the measured outcome y can be calculated using the following equation:

$$p(y \le j/x) = \frac{\ell^{-(\alpha+\beta_{\chi_i})}}{1+\ell^{-(\partial+\beta_{\chi_i})}} \quad (3)$$

4. Data Analysis

4.1 Descriptive statistical analysis of the sample

The study employs regression analysis to investigate the impact of internet usage on the psychological and mental health of elderly individuals. Results (1) and (2) represent regressions for the entire sample, (3) and (4) depict regressions for urban elderly individuals, and (5) and (6) reflect regressions for rural samples.

According to Table 2, internet usage significantly positively affects the physical and mental health of elderly individuals. Across the entire sample, internet usage demonstrates a notable positive impact on both physiological and psychological health at the 1% and 5% significance levels, respectively. Specifically, elderly individuals utilizing the internet show an increase of 10.8% and 6.7% in physiological and mental health compared to non-users. In the urban sample, internet usage notably impacts the physical health of elderly individuals, displaying a substantial 12.9% increase compared to non-users, while psychological health reveals a noteworthy 7.4% increase at the 10% significance level. Moreover, internet usage positively influences the physiological health of rural elderly individuals, exhibiting a significant 9.2% increase compared to non-users. However, the impact on the psychological health of rural elderly individuals seems insignificant. The observed disparities in impact might be attributed to the reliance of rural elderly individuals on physical social networks and face-to-face social support instead of internet-based social networks, potentially diminishing the internet's impact on psychological health [27]. Additionally, rural elderly individuals may face a digital divide, resulting in limited exposure to internet and digital technology compared to their urban counterparts, thereby reducing the substantial impact of internet usage[28].

In terms of control variables, economic status, education level, social class, marital status, gender, rural-urban residency, and political affiliation all exhibit influence on the physical and mental health of the elderly. Regarding economic status, it significantly impacts the physical and mental health of elderly individuals in both the overall sample and urban-rural settings at a 1% significance level, with a notably higher impact, particularly among urban elderly. Education level and social class also significantly positively affect the physical and mental health of the

elderly. Having a spouse positively influences the physical and mental health of elderly individuals, although the impact is not significant among urban elderly. Male elderly individuals exhibit higher levels of physical and mental health compared to their female counterparts. Elderly individuals with urban residency experience a 37.2% improvement in physical health and a 28.1% enhancement in mental health compared to those with rural residency. Party membership positively affects the mental health of the elderly but negatively affects their physical health. Specifically, elderly individuals affiliated with a political party exhibit a 30.5% increase in mental health but a decrease of 21.9% in physical health compared to non-affiliated elderly individuals.

Table 3. The regression results on the impact of the internet on physical and mental health

	(1) physical health global	(2) Mental health global	(3) Physical health urban	(4) Mental health urban	(5) Physical health rural	(6) Mental health rural
main						
internet	0.108***	0.067**	0.129***	0.074*	0.092**	0.061
	(4.10)	(2.42)	(3.39)	(1.84)	(2.48)	(1.62)
income	0.389***	0.491***	0.409***	0.566***	0.350***	0.365***
	(7.05)	(8.83)	(5.66)	(8.18)	(4.13)	(3.86)
edu	0.070***	0.067***	0.072*	0.053	0.073**	0.077***
	(3.04)	(2.86)	(1.89)	(1.33)	(2.49)	(2.71)
class	0.090***	0.096***	0.100***	0.103***	0.078**	0.084**
	(4.45)	(4.65)	(3.81)	(4.06)	(2.48)	(2.38)
married	0.258***	0.223**	0.118	0.129	0.444***	0.352**
	(3.08)	(2.54)	(1.05)	(1.13)	(3.50)	(2.54)
gender	0.296***	0.465***	0.275***	0.416***	0.310***	0.545***
	(3.94)	(5.99)	(2.81)	(4.14)	(2.59)	(4.44)
hukou	0.372***	0.281***	0.000	0.000	0.000	0.000
	(4.50)	(3.25)	(.)	(.)	(.)	(.)
Politics	-0.219**	0.305***	0.099	0.331*	-0.375***	0.299**
	(-1.99)	(2.63)	(0.53)	(1.68)	(-2.69)	(2.07)
R2						
adj. R2						

AIC	7342.346	6612.689	4357.861	4014.537	2986.180	2610.025
BIC	7412.297	6682.640	4415.850	4072.526	3040.950	2664.796
F						
N	2513	2513	1439	1439	1074	1074

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.2 Different internet usage Effects on elderly physical and mental health

The different ways of internet usage may have varying effects on the health of elderly individuals. This study employs a stepwise regression approach to analyze the impact of different internet usage paths on the health of the elderly.

Models (1) and (1a) reveal that internet usage has a significant positive impact on the physical and mental health of the elderly at the 1% significance level. Models (2) and (2a) find that even after considering the information source, the effect of the internet on the health of older adults remains significant and has increased in magnitude. Additionally, using the internet as the primary source of information exhibits a 20.2% decrease in physical health among the elderly at the 10% significance level compared to those not using the internet for this purpose. However, the impact of the internet as the primary source of information on the mental health of the elderly is not significant. Models (3) and (3a) present the regression results considering internet usage, information sources, and leisure-time internet use. The findings indicate that despite the positive impact of the internet on older adults' health, its effect diminishes after incorporating information sources and leisure-time internet use. The influence of information sources becomes more pronounced, adversely affecting both the physical and mental health of older adults. Moreover, leisure-time internet use significantly impacts the physical and mental health of the elderly negatively.

The reasons behind these outcomes could potentially be attributed to an abundance of negative internet content or an excess of topics inducing anxiety and stress, which might lead to adverse effects on both physical and mental health [29]. The negative impact of internet usage during leisure time might stem from excessive use, leading to reduced social interaction and physical activity. This reduction could potentially increase feelings of loneliness and foster depressive emotions, thereby adversely affecting both physical and mental well-being [31, 32].

Models (4) and (4a) present the regression results with the addition of interactions between leisure time internet usage and leisure activity preferences. Table 3 reveals that after incorporating these interaction terms, the significance and extent of the internet's impact on the health of older individuals decreased. However, the influence of internet use during leisure time increased, showing a negative impact on both physical and mental health by 11.2% and 18.9%, respectively. Moreover, the interaction between leisure time and leisure activity preference generally had a modest positive effect on older adults' health, albeit not highly substantial. Notably, the most significant impact was observed when using the internet for learning during leisure time, which significantly improved the physical health and mental health of older individuals by 4.2% and 4%, respectively, at the 1% significance level. Regarding the interaction between leisure time and social activities for older individuals, it showed a positive impact on physical health at a 1% significance level, indicating that older individuals engaged in social

activities using the internet during leisure time experienced a 2% improvement in physical health compared to those who didn't use it. However, this interaction did not significantly affect their mental health. Lastly, examining the interaction between leisure time and recreational activities for older individuals revealed a 1% significant positive impact on mental health. Specifically, older individuals who used the internet for recreational activities during leisure time experienced a 3.1% improvement in mental health compared to those who did not.

These interactions between various activity preferences and internet usage might offer multiple opportunities to fulfill needs, aiding in maintaining a balanced state of mind and a positive outlook. However, it's also observed that while there are positive effects within specific interactions between activity preferences and internet use, these factors might collectively have a relatively minor impact on the overall physical and mental health of older individuals.

Table 4. Different Internet Usage Effects on elderly physical and Mental Health

	(1) Physical health	(1a) Mental health	(2) Physical health	(2a) Mental health	(3) Physical health	(3a) Mental health	(4) Physical health	(4a) Mental health
main Internet	0.203***	0.178***	0.242***	0.210***	0.117**	0.107**	0.100*	0.091*
	(0.024)	(0.024)	(0.032)	(0.034)	(0.053)	(0.054)	(0.053)	(0.055)
Source			-0.202*	-0.169	-0.248**	-0.205*	-0.241**	-0.191
			(0.115)	(0.123)	(0.116)	(0.124)	(0.117)	(0.124)
Cyberleisure					-0.133***	-0.109**	-0.245***	-0.298***
					(0.044)	(0.044)	(0.059)	(0.060)
Cyberleisure_Leisocial							0.020***	0.004
							(0.007)	(0.008)
Cyberleisure_Leirest							-0.001	0.031***
							(0.009)	(0.009)
Cyberleisure_Lealrn							0.042***	0.040***
							(0.009)	(0.009)
/ Observations	2513	2513	2513	2513	2513	2513	2513	2513

** p < 0.10, ** p < 0.05, *** p < 0.01*

4.3 The heterogeneity in the impact of internet use on the health of the elderly

This section focuses on analyzing the impact of internet usage on the health of elderly individuals with different characteristics. Models (5) and (5a) indicate that the interaction between internet usage and marital status significantly positively affects elderly individuals at the 1% significance level. Specifically, internet usage enhances the physical and mental health of elderly individuals

with spouses by 14.5% and 16.5%, respectively, compared to those without spouses. Models (6) and (6a), incorporating the interaction between internet usage and gender, demonstrate a continued significant impact of the internet on the health of elderly individuals with spouses. Additionally, the interaction between internet usage and gender significantly influences the health of the elderly, with males experiencing an 8.5% and 15.3% increase in physical and mental health, respectively, compared to females. Models (7) and (7a) suggest that internet usage has a more positive effect on the health of elderly individuals with higher education levels, albeit with a relatively smaller magnitude of impact. Lastly, models (8) and (8a) reveal a significant positive impact on the mental health of elderly individuals based on the interaction between internet usage and party membership. Internet usage enhances the mental health of elderly individuals with party membership by 16.4%, while its effect on the physical health of these individuals is not significant.

Table 5: Heterogeneity of internet usage effects on elderly physical and mental health

	(5) physicalhealth	(5a) Mental health	(6) physicalhealth	(6a) Mental health	(7) physicalhealth	(7a) Mental health	(8) physicalhealth	(8a) Mental health
main Internet	0.084**	0.041	0.051	-0.013	-0.049	-0.143***	-0.049	-0.149***
	(0.037)	(0.039)	(0.039)	(0.041)	(0.046)	(0.048)	(0.046)	(0.048)
internet_married	0.145***	0.165***	0.132***	0.140***	0.126***	0.134***	0.126***	0.134***
	(0.034)	(0.036)	(0.034)	(0.037)	(0.034)	(0.037)	(0.034)	(0.037)
internet_gender			0.085***	0.153***	0.078***	0.145***	0.078***	0.121***
			(0.028)	(0.029)	(0.028)	(0.029)	(0.028)	(0.030)
internet_edu					0.029***	0.037***	0.029***	0.030***
					(0.007)	(0.007)	(0.007)	(0.007)
internet_politics							0.001	0.164***
							(0.035)	(0.039)
Observations	2513	2513	2513	2513	2513	2513	2513	2513

* p < 0.10, ** p < 0.05, *** p < 0.01

5. Result and Discussion

5.1 Research result

(1) Internet usage shows a positive correlation with the physical and mental health of elderly individuals, particularly demonstrating a more pronounced association among urban elderly

populations. Specifically, elderly individuals utilizing the internet show an increase of 10.8% and 6.7% in physiological and mental health compared to non-users.

(2) Regression analysis was performed to examine the impact of different internet usage patterns—internet use, using the internet as the primary information source, and leisure-time internet use—on the health of older adults. The results indicate that despite considering information sources and leisure-time internet use, the influence of internet usage weakens but still has a positive effect on the health of older adults. However, when the internet serves as the primary information source, it significantly adversely affects the physical health of older adults. Specifically, older adults who use the internet as their primary information source experience a notable 20.2% decline in physical health compared to those who do not use it for this purpose, while its impact on mental health is not significant. Furthermore, leisure-time internet use also negatively impacts the physical and mental health of older adults, leading to a decline of 24.5% in physical health and 29.8% in mental health for older adults who engage.

(3) Marital status, gender, education level, and political affiliation exhibit variations in the impact of internet usage on the health of older adults. For individuals with spouses and male elderly individuals, internet usage may be more beneficial in improving health status. Specifically, internet usage enhances the physical and mental health of elderly individuals with spouses by 14.5% and 16.5%, respectively, compared to those without spouses. Elderly individuals with higher levels of education tend to experience a more positive impact on their health from using the internet. Elderly individuals with urban residency experience a 37.2% improvement in physical health and a 28.1% enhancement in mental health compared to those with rural residency. Internet usage positively impacts the mental health of elderly individuals who are party members by 16.4%, although its influence on their physical health isn't statistically significant.

5.2. Recommendations

Based on the conclusions above, the following recommendations are proposed:

(1)Older adults need to strike a balance in their internet usage to harness its benefits while mitigating potential negative impacts on their health [11, 33]. Advocate for diversified internet usage among older adults[11], Older adults can explore health information, engage in learning activities, or interact socially online. However, it's important to manage their usage time sensibly, avoiding excessive immersion in negative content or aimless browsing. When using the internet during leisure time, older adults can search for health information, engage in learning, or socialize, but it's essential to select meaningful, positive content and avoid getting immersed in negative material to maintain both physical and mental well-being.

(2) Providing older adults with more digital skill training and guidance on internet usage can help them better utilize online resources, understand how to access more health information, and engage in meaningful activities [29, 34, 35].

(3) The diversity in social engagement types correlates negatively with the level of depression among older adults[35]. Additionally, volunteer services have also been proven to have a positive effect on the overall quality of life and happiness among older adults[36]. Thus, communities and governments can enhance social connections among older adults by encouraging their participation in social gatherings, clubs, or volunteer services.

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