Benefits and Barriers: A Qualitative Study of Online Social Participation Among Widowed Older Adults in Southwest China

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Abstract

Background: With the development of information and communication technology, online activities are increasingly becoming part of the daily life of the older adults. As the elderly would face changes in social interactions and activities due to widowhood, the importance of online participation may be more prominent in this group. However, in-depth evidence on the experiences of online social participation among widowed older adults is relatively sparse. This study aimed to explore widowed older adults' perceptions regarding online social participation in southwestern China.

Methods: A qualitative design of exploratory research was adopted. Semi-structured in-depth interviews were conducted with 19 widowed older adults between September-December 2020. The Colaizzi's method was performed for data analysis.

Results: Two major themes "benefits" and "barriers" were identified from the original data analysis. Subcategories concerning the category of "benefits" were "benefit perception (convenience, flexible time, supplementation)", "health promotion", "emotional comfort", "social connection". Subcategories of "barriers" included "worries: personal economic loss", "concerns: security of digital device", "troublesome: the diversity of online social participation", "difficulties: using digital media".

Conclusions: Online social participation of the elderly is a topic worth exploring. The widowed older adults can truly feel the benefits of online social participation, which can be as an important measure to facilitate successful aging, but there are also barriers for social participation. The level of participation is relatively low. It is recommended to increase the access to use digital media of the elderly, and improve their ability to use it through the support of relatives and friends, as well as targeted education. Meanwhile, companies need to consider the age-friendly design of digital media systems, and the government should further improve the network management system to create a safer network environment.

Background

The acceleration of aging population is a huge challenge for the world. It is predicted that by 2050, the number of people over the age of 60 would increase to 2.1 billion [1], and China's older population could reach 480 million [2]. As widowhood is a common event in the lives of the elderly, the rapid growth of elderly means that the number of widowed elderly will inevitably increase dramatically. The elderly who were widowed would face major life changes, such as social isolation [3], losing financial security [4], and changes in leisure activities [5], etc..

Social participation is a very broad concept, including leisure activities, entertainment, social interaction, volunteering, etc. [6]. The common social participation behaviors of the older adults include: meeting friends, exercising, volunteering, church activities, participating in senior universities, hobby clubs, etc.[6-9]. With the development of information and communication technology (ICT), more and more older adults around the world have begun to use new digital media such as Internet, smart phones, Facebook,

etc. [10-13]. As a result, social participation have been expanded online activities, including social networking [14], online shopping [15], and online health-related activities [16].

Participation is a significant embodiment of active aging. Promoting social participation helps the elderly achieve successful aging [17], and the World Health Organization has proposed that social participation was a key policy to cope with the aging of global population [18]. Activity theory believes that social participation can have a positive impact on older people. Several studies have documented that social participation could slow down the functional decline of the older adults, and reduce mortality and morbidity [19, 20]. Meanwhile, gardening, meeting friends, volunteering, and application of new technologies could reduce the feeling of loneliness of the older people [21,22]. Matz-Costa et al. [23] found that the widowed older adults participated in a large number of socially purposeful work, not only promoted healthy behavior, but also gained self-esteem, life control, and life meaning, thereby helping to relieve the grief caused by widowhood. In addition, online activities helps the elderly to think more actively, and improve their cognitive function [24]. It can be seen that both offline social participation and online social participation have a positive effect on the physical and mental health, and social adaptation of the older adults.

Currently the overall level of online social participation of the older adults is rising. However, owing to the unbalanced social and economic development, there are differences in the depth and breadth of online social participation for the older adults in different regions. Prior studies mainly focused on the content and mode of offline social participation of the older people [25], influencing factors of social participation [5,26], the relationship between social participation and health [27,28], the role of digital media in social participation [26]. However, there were few qualitative study about online social participation among widowed elderly. Therefore, based on in-depth interviews with the widowed older adults in Southwestern China, the aim of this phenomenological study was to explore widowed older adults' perceptions regarding online social participation.

Methods

Study design

A qualitative design of exploratory and phenomenology study was adopted in this study. This allowed for an in-depth insight into views about online social participation among widowed older adults. The phenomenology method is one of qualitative research approach, which mainly focus on the problems that are of great significance to people's life experience. As the method has been widely used [29,30], we adopted this approach to explore the widowed older adults' perceptions regarding online social participation in southwestern China.

Settings and participants

Purposive sampling was used to recruit participants from three teaching cooperative communities in Chongqing. Chongqing is a big city in Southwestern China. The population aged over 60 was 7.1955

million, accounting for 21.13% of the total population [31], which was higher than the average level in China. The inclusion criteria for the participants were as follows: (1) Aged between 60 and 90 years old; (2) Widowhood, without a dating or remarriage; (3) Be able to understand the questions and express himself/herself clearly; (4) Be willing to participate in the study. A total of 19 widowed older adults were recruited according to the principle of data saturation.

Data collection

Prior to being interviewed, participants were required to complete a brief demographic questionnaire. Afterwards, one-to-one semi-structured interviews were conducted to collect the information of the participants. A set of interview questions were originally designed according to the purpose of the study and literature review. They were then appropriately modified according to the experts' opinion and pilot interviews' result. Some examples of specific questions are listed as follows: (a) Nowadays some older people use digital media (e.g., personal computer, tablet computers, smart phone) to participate in various online activities, including social networking, shopping, seeking information, health-related activities, etc., have you ever participated in? What have you participated in? Please describe in details. (b) How do you feel about online social participation? (c) What changes have online activities brought to your life? (d) What difficulties did you encounter during the participation?

At first, potential subjects were identified by phone to establish interest in participation. The interview time was arranged according to the participants' schedule. Then, informed consent was signed after explaining the purposes and the contents of the study before the interview. All interviews were conducted in a quiet room by two researchers, both of whom were doctoral degree candidates with experience of qualitative study. Digital recording was used throughout the interview process so that ensure the accuracy and the reliability of data. Meanwhile, the non-verbal information of the interviewees were also observed and recorded. Each interview lasted approximately 30-50 min. Data collection was finished after there were no new information could be obtained. The data collection of this study lasted from September to December 2020.

Data analyses

Data collection and analysis were conducted concurrently. Firstly, the audio recordings were transcribed verbatim. Then, the Colaizzi's method was used to analyze the data in the following steps: (1) The full text was carefully read by two researches to get an overview of the data; (2) Significant statements and essential elements about online social participation were extracted from each transcribed text by each of researcher; (3) Repeated statements was coded; (4) The coded statements that shared the same meaning were clustered into categories and sub-categories; (5) Every extracted theme was described in detail; (6) Make sure that the statements reflected the fundamental structure; (7) To verify the authenticity of the results, researchers returned to the participants and discussed the findings with them. Two researchers analyzed the data and compared the results. When there were any differences, they had discussions with the study team to ensure the credibility of the data.

Results

A total of 19 widowed older adults were interviewed with a mean age of 73.84 years (range 64 - 87 years). Twelve (63.16%) were women; and seven (36.84%) were men. Thirteen (68.42%) lived alone. Fifteen participants (78.95%) had chronic diseases. Two participants had physical dysfunction due to Parkinson disease and visual impairment. The detailed characteristics of the participants are shown in Table 1.

TABLE 1 Demographic characteristics of the participants

Variables	
Age	
60-69	6
70-79	8
80-89	5
Gender	
Male	7
Female	12
Education	
Illiteracy	1
Primary school	4
Junior high	10
Senior high	3
College	1
Widowhood period (years)	
≤1	4
2-4	6
≥5	9
Type of residence	
Live alone	13
Live with children	5
Live with grandchildren	1
Monthly income (CNY)	
1000-2000	4
2001-3999	12
≥4000	3
Pension source	
Retirement allowance	15
Commercial insurance	3

Funds by the adult children	1
Number of chronic disease	
None	4
1-2	13
≥ 3	2

Data analysis revealed two major themes. These themes included benefits (benefit perception, health promotion, emotional comfort, social connection) and barriers (worries: personal economic loss, concerns: security of digital device, troublesome: the diversity of online social participation, difficulties: using digital media). The domains of the themes are presented in detail in Figure 1.

Benefits

Benefit perception

Almost all of the interviewees could perceive the advantages of online social participation, including convenience, flexible time, and supplementation.

The first benefit is convenience. Most participants talked about that they could get involved in online activities anytime and anywhere.

I mainly use mobile chat application to communicate with family members and friends. I can chat with distant relatives and friends in my own home. I find the communication between people is closer ... You can see each other through video chat, which is convenient to know their current situation... (D)

I like all kinds of online activities, such as social networking, shopping, online learning etc., which provide great convenience. (N)

Flexible time is another advantage. Some interviewees reported that they did not have time to get involved in some offline activities with friends, because they had to help their children with household work and took care of their grandchildren. However, they could use their spare time to participate in online activities.

It's happier to go outside with friends. I'm willing to participate in outdoor activities, but I don't have time. I have to look after my youngest grandson ... As long as I am free at home, I would contact with someone else by mobile chat app, as well as watch videos, browse news and health information. (G)

Supplementation is also an important superiority. Some interviewees described that age-related changes in physical health and function could increase vulnerability to the elderly, which would limited the older adults to participate in offline activities. Meanwhile, the outbreak of infectious disease also lead to the limitation of offline social participation. However, to a certain extent, online activities can make up for the

insufficient of social participation. The older adults can rely on internet and smart phone to participate in online activities, and they don't have to go out.

I have rarely been out since I was diagnosed with Parkinson two years ago ... I like chatting with my friends by phone. (I)

Because of the outbreak of COVID-19, we couldn't go out and meet my friends and relative, and only interact with them online. (D)

Health promotion

It's helpful to promote healthy behaviors through online activities. With the increase of age, the older adults begin to pay attention to information on health promotion and disease prevention, such as diet and nutrition, exercise, medication.

I often pay attention to health information on my phone. I can't ignore that knowledge, because I need to know how to take medicine, how to eat healthier. (N)

Several interviewees talked about they would exercise according to the fitness videos sent to their phone by other people.

I will follow the fitness videos sent by relatives or friends to exercise. (M)

Emotional comfort

For the widowed older adults, they may experience negative emotions such as grief, loneliness, depression, and exclusion, as well as feel social isolated. However, they could get emotional comfort through online social participation.

Interviewees talked about they felt happy when they contacted with family and friends through messages, voice or video chat.

I often have video chat with my family at night, and I feel happy when I see my grandson. (G)

Most of the interviewees described online activities help to relieve loneliness, because they experienced acute loneliness after being widowed, especially for the older adults who lived alone.

I lived alone, and when I felt lonely at home, I would watch some interesting videos, and chat with friends on my phone. Additionally, I would pay attention to the life that my friends shared on social media, and write some comments on theirs. (R)

Social connection

Online social networking can also facilitate contacts with relatives and friends. The interviewees stated they had frequent interaction with family and friends through mobile chat application. They often share

articles, pictures, news, or videos with relatives and friends.

I like contacting with my good friends. I often actively send them articles, which are meaningful, humorous, or educational, and they also send some to me. (N)

More than half of participants described that they have difficulties to use smart phone and corresponding mobile application at first, but they would seek help from relatives and friends, and this purposeful work also promote the connection with them.

I didn't know how to use it at first, then my daughter had taught me, and I was humble to study myself. Now there is no problem to use it. (N)

When I didn't know how to operate, I asked for help form my friends. Because of my friends, I could use chat application. (M)

Barriers

Worries: personal economic loss

Older people's worries about economic losses come from both personal and external reasons.

Visual degradation are common among the elderly, which would lower the older people' acceptance and openness towards online activities. Concretely, some interviewees with bad eyesight reject online shopping for the fear of economic loss due to operation mistake.

I don't like online shopping, because I have bad eyesight, and I am worried about making mistakes. (D)

For online shopping, it is inevitable that online shopping platforms will require personal information. However, some Trojan software, Internet interception and violent attack can snatch people's payment passwords while shopping online. Moreover, the unending fake websites and false information, together with new frauds taking place in succession will increase potential risks of online payment security. This was confirmed among most of our interviewees; as they were concerned about being cheated in online shopping:

I would definitely not go shopping online, because we can't see through everything as we age. There are so many cheaters on the Internet, I'm a little bit worried. (M)

I don't want to pay for something with my phone, because I am worried that others will know my bank card number and steal my money. (Q)

Concerns: security of digital device

Digital devices familiar to the older people include smart phones, computers, digital TVs, etc.. In this study, several widowed older adults expressed their concerns about the safety of digital devices:

I have read a piece of video news about phone exploding, so I'm worried that the smart phone would explode when it's charging. (M)

Troublesome: the diversity of online social participation

Driven by the wave of global information, people have been woven into the entire social network, which not only meet the basic physiological needs, such as reservation service and shopping, but also achieve self-value, including economic, cultural and political participation, etc.. However, the interviewees described that diversified forms of online social participation also bring confusion and trouble.

There are many activities I can take part in through smart phones. Meanwhile, these diversified activities have brought me some confusion. Concretely, as older people, I don't have good eyesight and enough energy now, and I don't know which activities are suitable for me. Therefore, I can't get involved in all the activities, and I just choose some of them that I am interested in and benefit from. (N)

Difficulties: using digital media

New digital media including personal computer, smart phone, and the corresponding application software, has attracted an increasingly attention to the older adults, but they are still new to the older people. As a result, most of the interviewees described they had difficulties in using digital media and lacked of self-confidence in using digital media.

I just know how to do simple operations on a smart phone, of course, it's difficult for me to do complicated ones. For example, I don't know how to complete the payment when shopping online. (P)

We are old and don't know how to use these, because we haven't learned them before. You know, it's not easy for us to use smart phone and computer. We are afraid of making mistakes. (Q)

Discussion

This study demonstrates that online social participation is a form of social participation worth trying for older adults. Firstly, it is more convenient comparing to traditional social participation. Online social participation mainly relies on ICT and new digital media. They are high-speed, and they break the limitations of time and space, etc.. There are five older people over 80 years in this study. With the increase of age, their organ function declines and their mobility is weakened, and they seldom go outdoors. In addition, two elderly with physical dysfunction in our study also face the same situation. However, online social participation can be used as a supplement and substitute for social participation. Meanwhile, older people with busy family affairs can use spare time to participate online activities. Our findings is consistent with the previous study that the new digital media has promoted social participation of disabled elderly and social isolated elderly [32]. Secondly, it stimulates the healthy behavior of the older adults. In our study, most of the elderly expressed that they like paying attention to information about how to keep healthy. For example, how to eat healthy, how to use drugs rationally, etc.. Some interviewees said that they would exercise according to the fitness videos sent by relatives or

friends. Research has found that physical exercise is closely related to improvement of mental distress, better physical performance [28]. It is somewhat noteworthy that the older adults could participate in various activities, such as searching for information online, online shopping, economic management, which also stimulate brain activity and help improve the cognitive function of the older adults [33]. Thirdly, it helps the widowed older adults get emotional comfort. There are thirteen widowed older adults living alone in our study, accounting for 68% of the total number. They talked about that no one at home can chat with, and they do not want to disturb the life of their children. When they were alone, they would socialize online, watch videos or news, etc., and they were happy to take part in various of online activities. Studies have reported that widowed older adults use ICT to increase social opportunities and obtain psychological compensation and spiritual support, which can reduce loneliness and social isolation [34,35]. Last but not least, it enhances social connection of the elderly. The study shows that online social interaction is the most important form of online social participation for the older adults. Specifically, the widowed older adults use digital media to make frequent contact with relatives and friends, and share information and resources with each other. This is consistent with previous report that the widowed elderly would get in touch with family and friends more closely and value supportive interactions, so that they could receive practical and emotional support to cope with grief and loneliness, and enhance adaptability [36]. However, unlike the traditional way, this connections were realized through online activities. As a result, this study further confirmed that online interaction of the elderly with family and friends is good for establishment of close relationships [24]. In addition, relatives and friends encourage and support the older adults to use digital media, as well as older people actively seek help from relatives and friends when facing difficulties in using it, which build a bridge of communication and further strengthen the connection and communication with peers and generations.

Our study shows that the purposes of online social participation for Chinese elderly is relatively simple, focusing on seeking spiritual satisfaction. Specifically speaking, the most common social participation of the older adults is social networking, followed by entertainment and information acquisition. This is also in line with the previous study that social motivation, entertainment motivation, and information acquisition motivation are the main reasons for the older adults to use digital media [10]. In our study, online activities of several elderly also involve shopping and online learning. However, social activities that require wisdom and creativity, such as political participation, consultation and decision-making, are not involved. This is similar to the report in other countries that social interaction, online shopping and and health-related activities are the mainly online social participation for the older adults [16,37]. It can be seen that, on the whole, the level of participation of the older adults in Chongqing is relatively low, focus on "survival" primary social participation, and the "developmental" social participation that requires knowledge, experience and skills is still very insufficient, which is related to the lower education of the elderly and insufficient social support.

In this study, only two widowed older adults often shop online via smart phones. Most widowed older adults are conservative about online shopping because the elderly are generally concerned about economic losses caused by personal and external reason. It was reported that privacy security was the most concern of the older adults in developed countries [38]. The current network security situation is still

severe. How to prevent privacy leakage and online fraud are the focus of online activities for the older adults. And then, this study shows that the older adults are troubled and confused by diverse online activities. However, they have to choose some of them to take part in due to their poor eyesight and limited energy reserves. Next, most of the elderly have difficulties in using digital media, because older people have poor memory and decreased learning ability, as a result, they have a fear of new technology. In this study, there were thirteen widowed older adults described their difficulties, and they sometimes need to depend on others for help. In addition, the user interface and operating system designed by the company also ignore the needs of the older adults. Finally, this paper also shows that economic income directly affect the online participation of the widowed older adults. There are eight widowed older adults whose monthly economic income is less than RMB 3,000 in this study, which is far lower than China's per capita income. Most older people talked about that they had to pay for their medical expenses of chronic diseases and living expenses. Therefore, some older people can't afford to buy a smart phone and network expenses.

With the development of ICT, the online social participation of older people around the world is increasing. According to our findings, four suggestions were proposed to improve the social engagement of the older adults (Figure 1). The first is to increase the access to use digital media of the elderly. Only when the older adults use the digital media and find their advantages, are they willing to participate in online activities. The higher the identification with digital media is, the higher the usage rate is [39]. At the same time, it is necessary to further stimulate the needs of the widowed older adults for digital media, and explore the suitable activities for the older adults to participate in. Moreover, it needs to encourage "developmental" social participation, such as health care, political participation, online learning, knowledge and experience sharing, etc., so that the elderly can make contributions to the society while gaining respect and realizing their self-worth. Secondly, it is necessary to continuously provide education opportunities to improve the ability of the elderly to use digital media. According to the reports, if the elderly knew how to use smart phones, they are more likely to use them [39]. Two measures should probably be taken. On the one hand, family and friends need to continue to support the older adults. When the elderly encounter difficulties, family and friends should provide timely help. Previous studies have reported digital back-feeding was the main way to solve digital divide [40]. On the other hand, it is necessary to carry out technical training and publicity education. Research has shown that group training can reduce the technical anxiety of the older people, overcome technical fears, and enhance self-confidence [41]. Communities, enterprises, or social welfare organizations should launch some training on digital media to relieve the technical concerns of the elderly, and enhance their enthusiasm for online social participation. Thirdly, companies should focus on age-friendly design of their equipment and operating systems. It's suggested that enterprises develop simple operation systems, and optimize the system with a high degree of visualization and voice assistance. For the elderly with physical dysfunction, it would be helpful to develop an intelligent information system integrating emergency calls, vital signs monitoring, service purchases, entertainment, and social interaction. Finally, it is advocated to further improve the network management system and strengthen supervision, so that create a safe network. Meanwhile, network

security education should be given to the elderly to relieve their security concerns about online social participation.

Limitations

This research was conducted among the widowed older adults in Chongqing of Southwestern China. Some viewpoints may differ from those in other countries because of the differences in social culture and economic development. However, despite this limitation we believe that this is a valuable study which reveals the unreported experiences of online social participation for the widowed older adults.

Conclusions

Social participation of widowed older adults in southwestern China have begun to integrate into the digital society, but it is still at an early stage with simple purpose of engagement. The widowed older adults can actually feel the benefits of online social participation, which can be as an important measure to facilitate successful aging, but there are barriers with it. Meanwhile, the level of online social participation is low, these situations are similar to the most parts of the world. Nurses are at the forefront of health care, with the purpose of promoting the health of clients. Nurses should pay more attention to the social participation of the older adults, encourage them to actively participate to maintain their health and achieve healthy aging. It is recommended to increase the access to use digital media of the older adults, further stimulate their needs, continuously improve their ability to use it through the support of relatives and friends and targeted education. Meanwhile, companies need to consider the age-friendly design of digital media systems, and the government should further improve the network management system, create a safe network.

Abbreviations

ICT: Information and communication technology

Declarations

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Authors' contributions

YL obtained funding for the study; YH, JT, YL, DhK, ZZ conceived and designed the study; DhK and ZZ coordinated the study; YH and Jj F collected the data and drafting the manuscript; YH, Jj F, JT and YL analyzed the data and interpreted the analyzed data; YH, SqL, JT and YL revised the manuscript. All authors read and approved the final version of the manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

The study was approved by the Ethics Institutional Review Board of the Army Military Medical University/Third Military Medical University (approval number 2020-013-02). All the procedures of the study were conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from each participant before participation in the study. The participants had the right to withdraw from the study without consequences.

Consent for publication

The manuscript does not contain any individual person's data in any form.

Competing interests

No authors of this study have personal, professional, or financial conflicts of interest to declare.

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References

1. United Nations. World Population Ageing 2015: Highlights. United Nations, New York;2015.
2. Wu C, Newman AB, Dong BR, Odden MC. Index of healthy aging in Chinese older adults: China health and retirement longitudinal study. *J. Am. Geriatr. Soc.*2018; 66(7):1303-1310. <https://doi.org/10.1111/jgs.15390>
3. Bennett KM, Chao Q, Roper L, Lowers V. "The deceased has left; the alive has to move on": Experiences of Chinese Widows in the UK. *Death Studies.*2018;42(8): 498-507. <https://doi.org/10.1080/07481187.2017.1387617>
4. Hansson RO, Stroebe MS. The Dual Process Model of Coping With Bereavement and Development of an Integrative Risk Factor Framework. *Generations.*2010;3:63-65. [https://doi.org/ 10.1037/11502-](https://doi.org/10.1037/11502-)

5. Jaumot-Pascual N, Monteagudo MJ, Kleiber DA, Cuenca J. Gender Differences in Meaningful Leisure Among Older Adults: Joint Displays of Four Phenomena. *Frontiers in Psychology*. 2018;9:1-11. <https://doi.org/10.3389/fpsyg.2018.01450>
6. Duppen D, Lambotte D, Dury S, Smetcoren A S, Pan H, De Donder L, et al. Social participation in the daily lives of frail older adults: Types of participation and influencing factors. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*. 2019;gbz045. <https://doi.org/10.1093/geronb/gbz045>
7. Baker S, Warburton J, Waycott J, Batchelor F, Hoang T, Dow B, et al. Combatting social isolation and increasing social participation of older adults through the use of technology: A systematic review of existing evidence. *Australasian Journal on Ageing*. 2018;1-10. <https://doi.org/10.1111/ajag.12572>.
8. Kikuchi H, Inoue S, Fukushima N, Takamiya T, Odagiri Y, Ohya Y, et al. Social participation among older adults not engaged in full- or part-time work is associated with more physical activity and less sedentary time. *Geriatrics & Gerontology International*. 2017; 17:1921-1927. <https://doi.org/10.1111/ggi.12995>
9. Monserud MA. Marital Status and Trajectories of Depressive Symptoms Among Older Adults of Mexican Descent. *The International Journal of Aging and Human Development*. 2018; 009141501775294. <https://doi.org/10.1177/0091415017752940>
10. Hunsaker A, Hargittai, EA. review of Internet use among older adults. *New Media & Society*. 2018;20(10):3937-3954. <https://doi.org/10.1177/1461444818787348>
11. Chan M. Mobile-mediated multimodal communications, relationship quality and subjective well-being: An analysis of smartphone use from a life course perspective. *Computers in Human Behavior*. 2018; 87:254-262. <https://doi.org/10.1016/j.chb.2018.05.027>
12. Silva BCS, de Ávila AA, da Silva Rocha G, Nunes DP, Della Lucia F, et al. The impact of the use of Facebook TM on social support networks and symptoms of depression reported by the older adults. *International Psychogeriatrics*. 2020; 32(3):407-408. <https://doi.org/10.1017/s1041610219000735>
13. Srivastava SK, Panigrahi PK. Social Participation among the older adults: Moderated Mediation Model of Information and Communication Technology (ICT). *Communications of the Association for Information Systems*. 2019; 44,(5):698-717. <https://doi.org/10.17705/1CAIS.04433>
14. Barbosa N B, Franz R, Judges R, Beermann C, Baecker Can digital technology enhance social connectedness among older adults? A feasibility study. *Journal of Applied Gerontology*. 2019;38(1):49-72. <https://doi.org/10.1177/0733464817741369>
15. Schehl B, Leukel J, Sugumaran V. Understanding differentiated internet use in older adults: A study of informational, social, and instrumental online activities. *Computers in Human Behavior*. 2019;97:222-230. <https://doi.org/10.1016/j.chb.2019.03.031>
16. Hong YA, Cho J. Has the Digital Health Divide Widened? Trends of Health-Related Internet Use Among Older Adults From 2003 to 2011. *The Journals of Gerontology Series B: Psychological*

17. Douglas H, Georgiou A, Westbrook J. Social participation as an indicator of successful aging: an overview of concepts and their associations with health. *Australian Health Review*.2017; 41(4):455. <https://doi.org/10.1071/ah16038>
18. World Health Organization. World report on ageing and health. Geneva;2015.
19. Gao M, Sa Z, Li Y, Zhang W, Tian D, Zhang S, Gu L. Does social participation reduce the risk of functional disability among older adults in China? A survival analysis using the 2005-2011 waves of the CLHLS data. *BMC Geriatrics*.2018;18(1). <https://doi.org/10.1186/s12877-018-0903-3>
20. Ang S. Social Participation and Mortality Among Older Adults in Singapore: Does Ethnicity Explain Gender Differences? *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*.2016;gbw078. <https://doi.org/10.1093/geronb/gbw078>
21. Davies N, Crowe M, Whitehead L. Establishing routines to cope with the loneliness associated with widowhood: a narrative analysis. *Journal of Psychiatric and Mental Health Nursing*.2016; 23(8):532-539. <https://doi.org/10.1111/jpm.12339>
22. Gardiner C, Geldenhuys G, Gott M. Interventions to reduce social isolation and loneliness among older people: an integrative review. *Health & Social Care in the Community*.2016; 26(2), 147-157. <https://doi.org/10.1111/hsc.12367>
23. Matz-Costa C, Carr DC, McNamara TK, James JB. Physical, Cognitive, Social, and Emotional Mediators of Activity Involvement and Health in Later Life. *Research on Aging*.2016; 38(7):791-815. <https://doi.org/10.1177/0164027515606182>
24. Quinn K. Cognitive Effects of Social Media Use: A Case of Older Adults. *Social Media & Society*.2018; 4(3):205630511878720. <https://doi.org/10.1177/2056305118787203>
25. Paggi ME, Jopp D, Hertzog C. The Importance of Leisure Activities in the Relationship between Physical Health and Well-Being in a Life Span Sample. *Gerontology*.2016; 62(4):450-458. <https://doi.org/10.1159/000444415>
26. He T, Huang C, Li M, Zhou Y, Li S. Social Participation of the older adults in China: The Roles of Conventional Media, Digital Access and Social Media Engagement. *Telematics and Informatics*.2020;101347. <https://doi.org/10.1016/j.tele.2020.101347>
27. Tomioka K, Kurumatani N, Hosoi H. Association between the frequency and autonomy of social participation and self-rated health. *Geriatrics & Gerontology International*.2017; 17(12): 2537-2544. <https://doi.org/10.1111/ggi.13074>
28. Owari Y, Miyatake N, Kataoka H. Relationship between social participation, physical activity and psychological distress in apparently healthy older adults people: A pilot study. *Acta Medica Okayama*.2018;72:31-37. <https://doi.org/10.18926/AMO/55660>
29. Vestl I, Debesay J, Pajalic Z, Bergland A. The importance of a good therapeutic alliance in promoting exercise motivation in a group of older Norwegians in the subacute phase of hip fracture; a qualitative study. *BMC Geriatrics*.2020; 20(1), 118-130. <https://doi.org/10.1186/s12877-020-01518-7>

30. Pan E, Bloomfield K, Boyd M. Resilience, not frailty: a qualitative study of the perceptions of older adults towards "frailty". *International Journal of Older People Nursing*.2019;00:e12261.
<https://doi.org/10.1111/opn.12261>
31. China National Committee on Aging. (2019, November 11) [Chongqing released the blue book on the development of older adults care services](in Chinese). Retrieved from <http://www.cncaprc.gov.cn/lly/190669.jhtml>
32. Millard A, Baldassar L, Wilding R. The significance of digital citizenship in the well-being of older migrants. *Public Health*.2018; 158: 144-148. <https://doi.org/10.1016/j.puhe.2018.03.005>
33. Quinn K. The cognitive benefits of social media use in later life: results of a randomized, controlled pilot study. In *Proceedings of the 8th International Conference on Social Media & Society*.2017;1-5.
<https://doi.org/10.1145/3097286.3097340>
34. Chopik WJ. The Benefits of Social Technology Use Among Older Adults Are Mediated by Reduced Loneliness. *Cyberpsychology, Behavior, and Social Networking*.2016;19(9):551-556.
<https://doi.org/10.1089/cyber.2016.0151>
35. Khosravi P, Rezvani A, & Wiewiora A. The impact of technology on older adults' social isolation. *Computers in Human Behavior*.2016;63:594-603. <https://doi.org/10.1016/j.chb.2016.05.092>
36. Wilder SE. Communication Practices and Advice in Later-Life Widowhood: "We Just Talked about What It Is like to Not Have Your Buddy." *Communication Studies*.2015; 67(1):111-126.
<https://doi.org/10.1080/10510974.2015.1119171>
37. van Deursen AJ, Helsper EJ. A nuanced understanding of Internet use and non-use among the older adults. *European Journal of Communication*.2015;30(2):171-187. <https://doi.org/10.1177/0267323115578059>
38. Dumbrell D, Steele R. Privacy perceptions of older adults when using social media technologies. In *Cyber Law, Privacy, and Security: Concepts, Methodologies, Tools, and Applications*. IGI Global.2019;1748-1764. <https://doi.org/10.4018/978-1-5225-8897-9.ch085>
39. Khoo SS, Yang H. Social media use improves executive functions in middle-aged and older adults: A structural equation modeling analysis. *Computers in Human Behavior*.2020;106388.
<https://doi.org/10.1016/j.chb.2020.106388>
40. Ball C, Francis J, Huang KT, Kadylak T, Cotten SR, Rikard RV. The Physical-Digital Divide: Exploring the Social Gap Between Digital Natives and Physical Natives. *Journal of Applied Gerontology*.2017; 1-19. <https://doi.org/10.1177/0733464817732518>
41. Borka JB, Andrej JB. Overcoming the digital divide with a modern approach to learning digital skills for the older adults adults. *Education and Information Technologies*.2019; 25(1):259-279.
<https://doi.org/10.1007/s10639-019-09961-9>

Figures

Figure 1

Domains of benefits and barriers and proposed suggestions about online social participation