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Effects of the Use of the Information and Communication Technology on Social Participation in Older Adults: Review of Literature

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Abstracts

Purpose: With the aging of the population, the development of Information and communication Technology (ICT) infrastructure and education systems attention is being paid to that can maintain social network in older adults. The objective of the review was to explore how effects of ICT use on social participation.

Participants and Methods: The studies included in this literature review were searched in three databases: PubMed®, MEDLINE with Full Text, CINAHL® with Full Text, Educational Resource Information Center, eBook Collection (ERIC). English language articles were searched using the terms 'older adults', 'information and communication technology', 'internet', 'information literacy', 'social networking', and "social participation".

Results: A total of 22 papers met the inclusion criteria, findings were fourfold, suggesting that: (i) more research is focused on the uses of internet technology, social network, digital health (ii); social participation was evaluated by ICT use, loneliness, social network, sociodemographic; (iii) the technology of using ICT is related to the growth background of the older adults; and (iv) improving device operability contributes to increased ICT acceptance.

Conclusion: Results suggest a need for studies that examine new and innovative forms of technology and meaningful of ICT use, highlighting the importance of learning skill of ICT use as one way to encourage social participation in older adults.

Key words: information and communication technology, older adults, social participation

Introduction

With the aging of the population, the development of Information and communication Technology (ICT) infrastructure and education systems attention is being paid to that can provide necessary services and monitoring even in remote areas to older adults. It is important for them to voluntarily support their own health management and decision-making in their motivation in order to the older adults can continue to participate activities in a society with peace of mind. The development of this ICT infrastructure and education system is consistent with policy of the Healthcare 2035 Proposal [1], for example, the importance of introducing e-health for the prevention and treatment of non-communicable diseases (NCD), which aims to advance technologies that can be used in health care. In addition, even for older adults whose transfer necessary for daily life are restricted due to physical restrictions, these maintenances are an important issue that is directly linked to the affluence of life. Recently, with the spread of communication devices such as smartphones and tablets, the number of older people who actively use the Internet is increasing year by year. ICT use is lead to "increased communication and activity", "providing fun, joy, stimulation, and peace of mind", "health improvement" and "whereabouts and role formation", and have the effect of improving the motivation and life satisfaction of the older adults. These are expected to have the effect of improving the motivation and life satisfaction of older adults [2]. As an advanced approach to ICT, online lectures on leisure activities by the older adults (UK) and senior YouTubers have emerged as well, and information is being disseminated using ICT. However, this is a practical example by some older adults, and most of the viewers are young adults. There are some older adults who master various devices such as smartphones and information contents like young people, but in many cases, the introduction and operation of new devices is a high barrier. Social participation of the older adults is important for prevention of loneliness, acquisition of spiritual affluence and purpose of life, and maintenance of health. In order for the older adults to continue to participate in society, it is essential to acquire knowledge (literacy) regarding the use of ICT and to communicate with friends and family when and by the necessary means. Therefore, in this study, we focus on whether ICT can be utilized which many older adults usually use as a means of communication. ICT use is not only can information on preventive care be shared, but social interaction can be carried out remotely through two-way information exchange, which will have a positive effect on the motivation and satisfaction of life itself. It also has great potential in a society with a risk of spreading infectious diseases such as COVID-19.

Recently, the number of research reports on ICT use is increasing, and there are also reports that systematically summarize the effects of the current state of ICT use [3]. However, there are few reports summarizing the impact of the independent use of ICT by the older adults on social participation. This literature review intends to explore the impact of the use of the information and communication technology on social participation of older adults and discusses the published evidence in relation to the impact of information and communication technology use on the older adults specifically in terms of participation and practice.

Participants And Methods

The studies included in this literature review were searched in Five databases: PubMed®, MEDLINE with Full Text, CINAHL® with Full Text, Educational Resource Information Center, eBook Collection (ERIC). The PRISMA flow diagram summarizes thesystematic review (Fig. 1). Search strategies on PubMed were: 1) older adults AND social participation AND information and communication technology, 2) older adults AND social participation AND internet, 3) older adults AND social participation AND social networking, and 4) older adults AND social participation AND information literacy. The date range was limited to a time period from 2011 to 2021. In total, 114 full-text articles were accessed, which examined the impact of ICT use on the social participants of older adults. The studies that investigated the health impact or use of assisted technologies (for example e-health) in the healthcare domain did not focus on social participation of older adults, and those studies which focused on specific groups of older adults with disabilities (for example mental health, depression, dementia) were excluded.
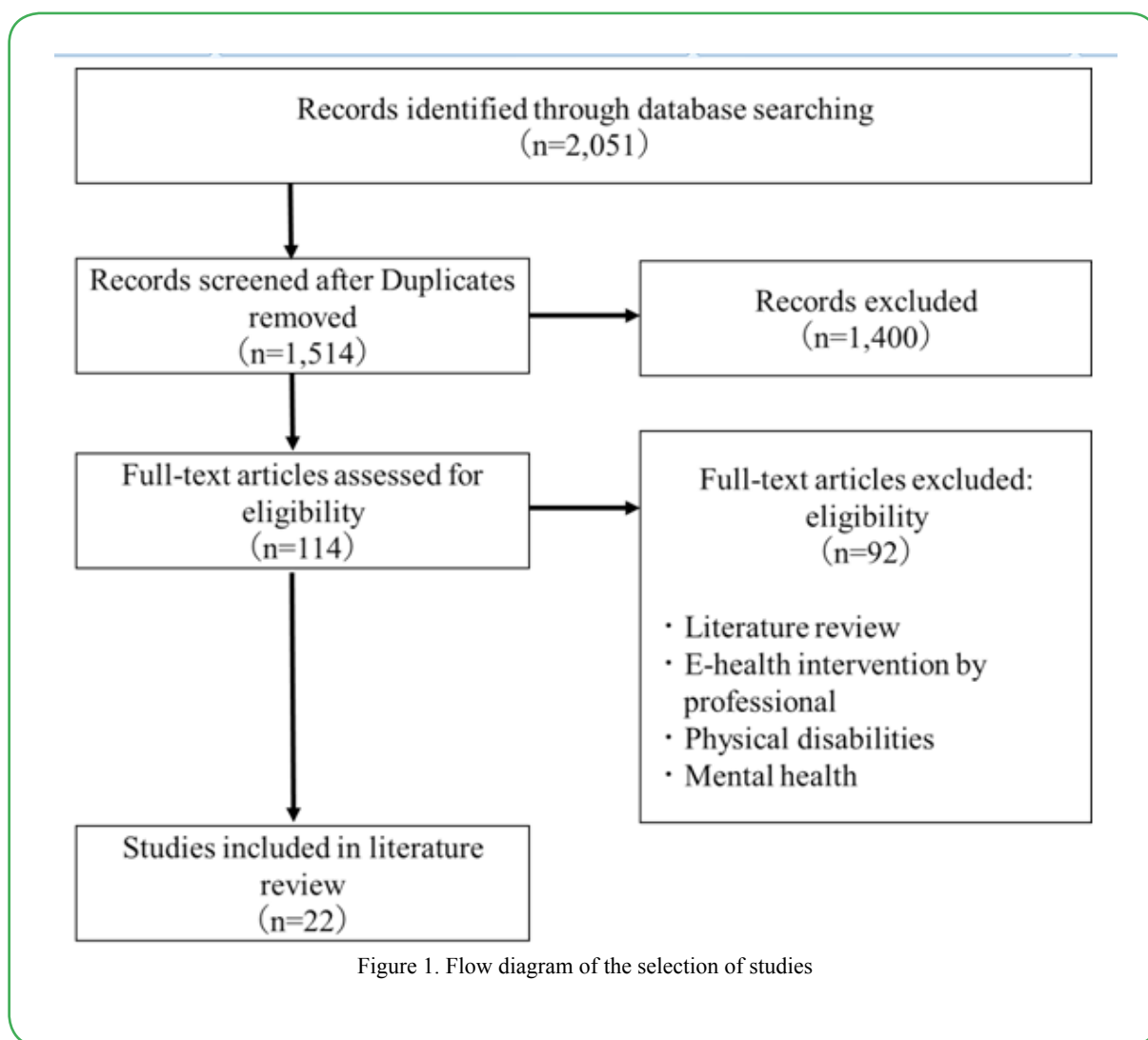

Figure 1. Flow diagram of the selection of studies

RESULTS (Review of literature)

After screening by title and abstract, 114 articles were reviewed for relevance to this particular article and 22 articles were included for discussion in the literature review (Table 1). In this table, both the methodology and key outcomes are also reported, as well as what social concepts are utilized as outcome measures.

Of the 22 papers reviewed, the 19 papers comprised survey research related to older adults' use of ICT (see Table 1). The types of ICT included not only the Internet but also social media. These survey research outcomes included 3 papers that included a survey on older adults' digital skills and information literacy. And there were 4 intervention studies that showed a direct effect on social participation.

Referance	Country/age gruop	Methodology	Outcomes
Poli (2019)	Sweden/60 Years of age and adove	n=70; predictors for individual decisions to participate in digital health research; cross-sectional survey (questionnaire)	socioe conomic factors,subjective health ans subjective over all quality of life (subjective overall QOL), social participation, time resources, and use of technology and digital skills.
Anderberg (2021)	Sweden/60 years of age and above	n=386; measuring socail participation Over the internet, quantitative (interview)	social internet score, social participation score, TechPH ("an instrument for measuring older people's attitudes towards technology") ,eHEALS (" measuring consumers' combined knowledge , comfort, and perceived skills at finding, evaluating, and applying electronic health information to health problem
Blazun (2014)	Slovenina/65 years of age and avobe	n=100; internet use and motivation for information and communication technology; quantitative (questionnaire)	usage and motivation of information and communication technology
Blusi (2018)	70 years of age and avobe	n=14, meaningful Individualized Social Activites; develop of system and Qualitative	meaning unless of the activity
Chiu (2019)	Taiwan/50 years of age and avobe	n=248; Internet usage pattern was associated with social in engagment in real life ; quantitative (interview and questionnaire)	Internet usage, social engagement, including participation in social club, religion activity, voluntary group, life-long learning ,and exercise club, Sociodemographic
Fischi (2020)	Sweden/65 years old average	n=18; interviews were about daily activities, social netwrok and activities , participation in society, digital technology, and existing and desired services, qualititative (interview)	digital engagement, social participation
Gonzalez (2012)	Spain/55 years of age and above	n=240; reason to attend course of training information and communication technologies; quantitative (questionnaire)	sociodemographic variables, the questions concerning the behavior and beliefs about the activities, the training course, and themselves
Myhre (2016)	73 years of age and above	n=41; comparison cognitive benefits in tthree group (Facebook group, Online Diary group, and Waitlist group) after trainig SNS; controlled study (questionnaire)	Frequency of website use, Exective function , Speed of processing, UCLA Lonliness scale, MOS Social support survey, Lubben Social Netwrok Scale, Social Provision Scale
Kim (2017)	United States/65 years of age and avobe	n=6476; ICT acess and use for different purposes are associated with social engagement, quantitative (interview)	Social engagement, ICT use, Physical health conditions, Size of social netwrok, Sociodemographic
Kobayashi (2015)	English /50 years of age and avobe	n=4368; correaltion between internet use and social engagment, quantitative (interview)	Socioeconomic indicators, internet use, Social engagement, Health literacy, baseline memory, baseline executive function, cultural engagement
Lee (2021)		n=5; training of moblie apps using artwork and games(n=19), interview of attitudes towords interactive technology; qoliative (interview)	usage and motivation of inforamtion and communication technology
Segui (2019)	Catalan/65 years of age and avobe	n=38; the Collaborative Learning of content realted to the useof moblie devices, comparison (junior users 42 young people between the ages of 14 and 15 years) ; mix method	quantitaive and qulitative survey to Collaborative Learning

Table 1. To be a Cont...

Meshi (2020)	United Staes/60 years of age and avobe	n=213; questions regarding their soical media use, social is olation, living situation; quantitative (questionnaire)	Social media use, social isloation, living situation
Nashi (2012)	Finland/60 years of age and avobe	n=542; correation between ICT activity and lesiure activity , quantitative (postal survey)	internet use, social isolation, living situation
Nimrod (2013)	16 English- speaking/55 years of age and avobe	n=218; Participation in Onlie Communitcation; quantitative (quetionnaire)	Participation patterns, Interest in issues discussed in the communication, Benefits of participation, demographic and sociodmographic
ODERUD (2017)	Norway/78 years old in average	n=15; follow up by volunteers between 12 and 16 years of age; longitudinal study (interview)	Social Contact and Participation, Sense of Accomplishment, Confidence and Thriving
Correa (2019)	Chile/50 years of age and avobe	n=253; use of SNS focuses on the hedonic side; cross-sectional survey (interview)	Perceived Ease of Use, Perceived Usefulness, Pereived enjoyment, Use
Cataluna (2020)	Chile/60 years of age and avobe	n=384; use of SNS; quantitative (quetionnaire)	SNS usage, Sociodemographic
Sakurai (2021)	Japan/65 years of age and avobe	n=2985; Relationship between SNS nad mental health, comparison (5591 people between the ages of 18 and 64 years) ; quantitative (questionnaire)	SNS usage, mental health, Loneliness, well-being, Sociodemographic
Sun (2020)	Chin/60 years of age and avobe	n=669; the current state of the use of the Internet by the elderly and factors influencing it; quantitative (questionnaires)	socio- demographic, internet use, need for digital health technologies, factors affecting Internet us, EQ-5D scale, the UCLA-20 Loneliness scale
Willard (2018)	Netherlands/65 years of age and avobe	n=33; intervention by online community care platform and survey of userbility and user experiences; quolitative (interview)	Frequency of website use, social participation, communication, use experience
Willard (2020)	Netherlands/65 years of age and avobe	n=47; the use, expectations, and perceived impact regarding the online; quantitative (questionnaires)	internet use, informal care, Community Involvement

Table 1. Summary of studies discussed in the literature review

ICT usage status in older adults

A study that conducted a large study of the use of ICT with socio-demographic variables found that ICT access was more common among men than women [4]. Most of ICT users use the Internet as a means of communicating with other people [5,6], and the purpose of using ICT was banking, followed by health information and shopping. Regarding the types of ICT, there was a tendency to use Youtube and LINE a lot, followed by Facebook, and Twitter and Instagram were used relatively infrequently [7,8].

Regarding the frequency of ICT use [9], the infrequent use group of Internet (57%) tended to be higher than the frequent use group of Internet (43%). Regarding the usage period, most of them (89%) have been using the Internet for 3 years or more, and 60% of them answered that they do not need support from others to operate the Internet [9,10]. Time of one-time usage was the medium averaged 2 hours in a study investigating the use of social media [11], less than 2 hours in a study investigating the use of internet [12].

In a study that analyzed the patterns of behavior about Internet use, participants were classified into Eager Users (20%), Instrumental Users (20%), Leisure Users (32%) and Sporadic Users (25%). And these behavioral patterns may include many participants of the following: Eager and Instrumental users are retired, Sporadic users with a low education level, Leisure users are active and with a higher education level.

Factors related to ICT use in the older adults

Relationship to ICT use in the older adults was analyzed factors as follow; sociodemographic, socioeconomic, health literacy, digital skill, social network, education level, cultural engagement, memory, executive function, quality of life (QOL), leisure activity, well-being, social participant, and social engagement.

Sociodemographic and socioeconomic were used index such as age, gender, marital status, monthly income, and ownership of a house [12,5]. In all indicators, there was a difference between ICT users and non-users, and it was listed as an influential factor for ICT use.

A study focusing on cognitive function in the older adults using ICT showed that low memory and low executive function affect poor health literacy, noted that health literacy and cultural involvement are significantly associated with the Internet use [13].

Index of well-being and QOL were used EQ-5D measuring health-related QOL, WHO-5 measuring mental health status, and K6 measuring loneliness. Frequent usage of LINE (both posting and checking) among older adults was associated with better well-being [8], Internet use were associated with QOL [12].

There was also a literature showing that the relationship between Internet use and leisure activities in the older adults is high, even when considering variables such as sociodemographic, socioeconomic, and health status [9].

Digital skills in older adults

There are some literatures focusing digital skills as a factor in whether older adults people can utilize ICT. Relationship to digital skill in the older adults was analyzed factors as follow; knowledge of ICT, motivation of ICT use, older adults' attitudes towards technology, Executive function, Speed of processing [14]. As for the motive for ICT use, lack of knowledge and age was cited as the reason for not using it [6]. Index of knowledge of ICT were used eHEALS measuring consumers' combined knowledge, comfort, and perceived skills about health, older adults' attitudes towards technology was used TechPH score. The score of eHEALS and TechPH were assosiated with social participation score [15].

In research of comparison cognitive benefits in three group (Facebook group, Online Diary group, and Waitlist group) after trainig SNS, executive function and speed of processing was increased in Facebook group [16]. There was also report showing that as a result of setting up a place for mutual learning using mobile devices between generations, it created security and motivation for the older adults and reduced the digital divide [17].

Effects of the ICT use on social participation in older adults

Many studies analyzing social participation by the size of social networks were hit, but only research using ICT was adopted.

In a study examining the link between ICT use and social engagement, those who agreed to the digital health survey tended to have a higher social participation rate, and agreed group wanted more social contact than the younger generation [18]. Both access and use of ICT were associated with visiting with family or friends and going out for enjoyment. As a result of analyzing the social engagement focusing on club activities, organizational activities, volunteers, and religion, use of ICT was associated with increase in clubs, volunteers, or organized activities and volunteering [4]. The 4 behavior patterns in internet use have been shown to be important factors in predicting daily social engagement, and eager and leisure users suggested higher social engagement scores than sporadic users [19]. On the other hand, as a result of evaluation by BSMAS measuring psychological dependence and the estimated daily time, there was also a report that problematic use in social media was associated with social isolation [11].

In a literature focusing social network, interviews showed that the experience of using social sites was relevant to the response that it helped expand social networks [15]. In a report that qualitatively analyzed the perceptions of older people about the context surrounding social participation in the digital world, resulted in three categories: experiencing conditions for social participation in a state of flux, perceiving drawbacks of urbanization on social participation, and welcoming digital technology that facilitates daily and community living. These categories were encapsulated in the theme the juxtaposition of narrowing offline social networks and expanding digital opportunities for social participation [20]. In research analyzing online communities, as 3 segments of community members were identified: information swappers, aging-oriented, and socializers. These groups differed in their interests, background characteristics, and participation patterns [21].

In a study that attempted to increase ICT use for the older adults by developing an online platform and introducing the device, we focused on the ease of use of participants and repeated development and modification to enable interactive communication, and allowed frequent manipulation of contacts, services, and messaging [22]. However, later studies showed that the participants' overall perceived impact of Online Platform did not provide sufficient added value from results that was significantly lower than they had expected with respect to "information provision about Online Platform", "seeking help from fellow villagers", "giving help to fellow villagers", and "consulting care or welfare services" [5]. On the one hand, by learning the basic skills, there are also reports that participants has come to express feel a sense of accomplishment, confidence, prosperity and pride to contact relatives who have not met for many years [23]. In addition to the above reports, there was also a case report that introduced interactive technology by utilizing the elements of the game [24], and the development of a digital coaching system to increase the social participation of the older adults through simplified web technology [25].

Summary of the studies

The studies looking at ICT use in the older adults are detecting an increase in the last decade. More research is focused on the uses of internet technology, social network. Little research focuses on effect on social participation. Social participation was evaluated on the K6 scale, which measures loneliness, and the impact of ICT use on social participation of the older adults was evaluated by a survey of the relationship between ICT usage and social demographics and changes in social networks. In these studies included the quantitative analysis, qualitative analysis, mixed methods approach, but the sample size for some studies was small. All the studies reviewed here related to effect of ICT use on older adults were done not only in developed countries but also developing countries. It was found that the use of ICT by the older adults is divided according to their behavioral patterns, and that the technology of using ICT is related to the growth background of the older adults, such as their educational history. The results of this review show that efforts to reduce the digital divide through evaluating meaningful of ICT use and training skill of ICT use are important to encourage social participation in older adults.

Conclusion

This study reports review of literature from the science as well as the field of education to explore how technologies are being used to promote social participation among older adults. With the spread of communication equipment worldwide, the ICT use is drawing attention in both developing and developed countries. Majority of the studies substantiate the advantages of internet use by older adults including the ability to communicate with family and friends, maintain a social network, have access to information and participate in online community. The review identified 22 papers that addressed this topic, highlighting the importance of learning skill of ICT use as one way to encourage social participation. It was also seen there are behavioral patterns in the ICT use, and that the economic and educational background of the older adults is related. In the future, in order to further improve the acceptance of ICT in the older adults, it will be necessary to update technology such as loading fun elements, interactive communication, and improving operability by simplifying interfaces.

Conflicts of interest: The authors declare that they have no competing interests.

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