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# A review on internet use and quality of life of the elderly

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**Abstract**

As the world population rapidly ages, improving the quality of life (QOL) of the elderly and enabling them to age actively is increasingly becoming a global policy concern. In this context, emphasis is also given to information and communication technologies (ICTs) that may play a significant part in enhancing the QOL of the elderly. This review study explores the impact of Internet use on QOL of the elderly by examining available researches in this field. By searching on ADM Digital Library, WEB Science, ERIC, PsycINFO and PubMed databases, this study reviewed 25 studies published after 1990 that investigate the relationship between Internet use and QOL of elderly. The synthesis of the research findings indicates that the functional use of computer and Internet improves QOL for older people. The findings also provide a comprehensive perspective on the current state of knowledge and raises questions for further research.

Keywords: elderly, Internet use, quality of life

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## 1. Introduction

Development of information and communication technologies (ICTs) and demographic aging have been two major social developments since the second half of the 1990s. With the advancement and spread of ICTs, personal computer has been incorporated into daily life and has transformed many aspects such as education, business and communication. Today, the ability to use ICTs is considered as a prerequisite of the "information society".

The information society is also an aging society. In the second half of the 20th century, both developing and developed countries underwent a demographic transition caused by decreasing fertility and increasing life expectancy. As a result of this, the number of older population has increased at a considerable pace. As the world population is aging rapidly, improvement in the quality of life of older people and enabling them to age actively has assumed higher priority in the policy agenda of many countries. Active aging means "helping people stay in charge of their own lives for as long as possible as they age and, where possible, to contribute to the economy and society" (http://ec.europa.eu/social/main.jsp?catId=1062&langId=en). In the 2002 Madrid International Plan of Action on Aging, it was declared that opportunities for individual development, self-fulfilment and well-being throughout life as well as in later life should be provided (MIPAA, United Nations, New York, 2002). In this respect, the significance of technology was underlined in terms of reducing marginalization, loneliness, and intergenerational differences. It was also highlighted that older people should have access to ICTs and benefit from its advantages.

Given the increasing share of ICTs in everyday life, understanding and examining the role of the Internet for the life quality of the older population is essential in aging societies. However, much of the existing research has focused on younger age groups who are perceived as the more active Internet users. Although studies on computer and Internet use are typically concentrated on youth, in recent years there has been a gradual increase in studies about older Internet users. Kim (2008) carried out a review study on older Internet users and found that the studies revolved around five themes: 1) the motivations and barriers of older adults' usage of computers, 2) identifying age-related differences in computer learning and usage, 3) suggesting instructional tips and design, 4) changes in attitudes and benefits, and 5) older adults' Internet usage. Findings from this review indicate that older people use the Internet to communicate with family and friends, to make new friendships or maintain old social contacts, follow the news, gather information about goods and services, search for health related information, shopping, performing banking transactions and leisure activities.

Quality of life (QOL) is "a multidimensional concept embracing subjective and objective appreciation of a person's life situation in the context of their socio-cultural and economic environment" (Phillips, Ajrouch & Hillcoat-Nalletamby, 2010). Due to its interdisciplinary nature, QOL has many definitions, models and scales, and no single and agreeable definition of QOL is available. Current studies frequently use the World Health Organization's (WHO) definition. WHO defines QOL as "the 'individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHOQoL, 1998).

The determining factors for QOL in old age vary between groups of older people. According to the findings from previous studies, the most common determinants for QOL for the elderly are good health, functional capacity, a sense of personal control, social participation, intergenerational relationships, availability of friends and social support, and socio-economic status (Walker & Mollenkopf, 2007). The role of ICTs in determining QOL of the elderly has generally been neglected by social gerontologists and existing studies focus principally on medical and assistive technologies (Xie, 2007). As Mollenkopf and Walker (2007) stress there is a need for interdisciplinary research on how technological developments and their enormous impact on different spheres of everyday life improve QOL for older people.

The aim of this study is to examine the impact of computer and Internet use on the quality of life of the elderly. To this end, studies which examine the relationship between Internet use and QOL for the elderly were reviewed and research synthesis was carried out. The findings of this

study are expected to provide a comprehensive perspective on the available research which raises questions for further research.

## 2. Method

The literature on the computer and Internet use of the elderly covers many disciplines including information and communication technologies, gerontology, educational sciences, psychology, health sciences and social work. Therefore, the studies included in this review were searched in databases of various disciplines, as follows: ADM Digital Library, WEB Science, ERIC, PsycINFO and PubMed databases. English and Turkish language articles were searched using keywords “older”, “elderly” “senior” “well-being” “life satisfaction” “happiness” “quality of life” “Internet”, “computer”, “ICT”, “yaslı”, and “bilgisayar”. The search was conducted in February-March 2015. The cut-off date of 1990 was selected for review since this approximates the widespread use of personal computers. In total, 32 articles were accessed which studied the impact of computer and Internet use on the quality of life of elderly. The studies that investigated the effects of medical and psychological intervention programs on elderly were excluded from review process. Thus, this study reviewed 25 articles.

## 3. Findings and Discussion

The findings of this study show that computer and Internet use affects the QOL of the elderly in different ways. One of the most important impacts of Internet use for older people is that it enables them to establish and maintain social relations. Social relations including social network and social support is a form of social capital which influences QOL. As Announce and Ajrouch (2007) argue “people with few social relations tend to be marginalized and have lower life quality, while people who are interconnected, tied to others, and generally engaged in interactive activities tend to be more positively adjusted, and have better mental and physical health”. They define the social network as the “structure of individuals with designated relationships to focal person. It varies in terms of the network members, frequency of contact, geographic proximity, and composition”. Antonucci and Akiyama (1987) state that in old age contact with peers may decline with age due to health problems or moving, and peers and family members may be lost through death and not replaced” (as cited in Phillips et al., 2010).

Several studies have shown that the Internet facilitates social interaction and communication (Sum et al., 2008a; White et al., 2002) and older adults can use the Internet to communicate with family members and friends. Penard and Mayol (2015) also state that Internet use allows individuals to complement their face-to-face interactions with family members and friends. In addition, “they can also interact online with people they have never met physically and make new virtual friends” . Hence, the Internet provides communication facilities for the elderly which protects them from social isolation.

One of the earliest studies investigating the effect of Internet use on the social relations and QOL of the elderly was the intervention study conducted by White et al. (1999). In this study, Internet and e-mail access were provided to older adults of a retirement community. According to the findings of the study, there was a significant decrease in the loneliness and social isolation level of the elderly in the intervention group after completing the training. The loneliness and social isolation scores of those in the comparison group, on the other hand, remained unchanged. However, as the authors remarked, the Bradbrun Affect Balance Scale scores of the elderly participants yielded high scores at the beginning of the intervention which caused a “ceiling effect”. Therefore, the impact of Internet use on the QOL of the elderly could not be measured. Nevertheless, qualitative data obtained from the interviews with participants supported the finding that Internet use has a positive effect on QOL for those in their later years. The authors also pointed out that intervention on computer use has the potential to improve well-being of older adults based on the evidence from the first data obtained from the study.

In another randomized-controlled study by White et al. (2002), the psycho-social impact of Internet use on older people was examined. One hundred older adults who reside in congregate housing sites and two nursing facilities either received Internet training for five months or was included in a control group. At the end of the training, 60% of the elderly in the intervention group continued to use the Internet regularly. Although the decrease in the level of loneliness and depression was higher in the elderly of intervention group compared to elderly of control groups, there were no statistically significant changes in psycho-social measurements between the two groups. The Internet users (n = 29) in the intervention group had less tendency toward loneliness and depression. Moreover, they had a more positive attitude towards computer and Internet use, and more confidants. The results of the qualitative data analysis also showed that Internet use has positive psycho-social effects on older Internet users.

Osman, Poulson, and Nicolle (2005) summarized the findings of the two-year Care OnLine (COL) pilot project in their study. Under the scope of COL project, 50 elderly persons were provided with a computer, shared Internet access and a special Web portal designed for the specific needs of older adults. Elderly participants received computer and Internet training during the project. Meanwhile, interviews with the elderly participants were carried out and the findings about their attitudes toward computer and Internet use, and experiences were recorded. The majority of the elderly respondents (82%) reported that Internet access and use of e-mail had significant positive impact on their quality of life. At the end of the project, most of the participants described the computer use as the "window to the outside world". Moreover, Internet and e-mail access reduced the social isolation of the elderly and improved their social interaction. Only a small percentage of the respondents (13%) reported that Internet and e-mail use had minor effect on their QOL. They, however, explained the reasons for their limited use of Internet as lack of interest, still being in the process, and the limited perceived benefits of computers.

Sum, Mathews, Hughes, and Campbell (2008a) explored the impact of Internet use on the elderly's sense of belonging to a community and found that Internet use facilitates the social interaction of the elderly with family members and friends, and extends their social network. They suggest that there is a complex relationship between Internet use, social capital and well-being, and that Internet use affects social capital and well-being of elderly in different ways. In addition, the purpose of Internet use was as significant as duration of Internet use. The authors stated that various Internet applications could be both beneficial and detrimental for older Internet users. The use of the Internet to search for information and to communicate caused a more positive impact on the social capital, loneliness and well-being of older participants. The use of Internet to meet with new people and for leisure activities, on the other hand, reduced their well-being. Thus, the authors suggest that older Internet users should be made aware of the effects of Internet use and encouraged to use it in order to improve their social capital and well-being and reduce their loneliness. Sum, Mathews, Pourghasem, and Hughes (2008b) used the data of the same research and also tried to find the effect of Internet use on the loneliness of older Internet users. They found that there was a negative association between loneliness and well-being of older Internet users and the extensive use of the Internet as a communication tool reduced their social loneliness. Nevertheless, its use in order to meet with new people increased the emotional loneliness of older Internet users.

Mellor, Firth, and Moore (2008) studied the impact of Internet use on the social isolation and well-being of the elderly. To this end, 20 elderly residents in the retirement village received computer and Internet training for 12 months. At the end of the training, the well-being scores of the older participants slightly decreased, but remained between ranges of 70-80. Qualitative data obtained from the interviews with older participants about their experiences of computer use indicated that the majority of the older participants had a positive attitude towards Internet use. They reported that to learn how to use the computer and have access to the Internet integrated them with modern world. Researchers suggest that the differences between quantitative and qualitative data stem from the fact that the impact of Internet use on the well-being of elderly is "more complicated than suggested and wider than assessed psychometrically".

Lelkes (2012) analyzed the impact of Internet use on the social isolation and well-being of elderly by using the dataset of the European Social Survey (ESS1), which includes nationally representative samples of 50,000 individuals from 26 countries. The study included 11,000 Internet users aged 65 and over. The results of the study showed that the elderly who use the Internet regularly are less likely to feel social isolation. Moreover, there was a significant positive association between regular Internet use and life satisfaction. As the findings indicate, face-to-face encounters do not replace online communication; to the contrary, they complement it. Even though the elderly communicate with their family and friends through the Internet, they still prefer to meet face-to-face. It was also found that older persons who use the Internet regularly had a lower possibility of meeting face-to-face. Thus, it was concluded that Internet use improves the psychological well-being and reduces social isolation of older Internet users as long as they do not become addicted to it.

Social support is the functional content of relationships and an important factor for QOL for the elderly. Types of social support include emotional, instrumental, informational and appraisal supports (Phillips et al., 2010). Computer and Internet use enables older Internet users to access useful information on health, hobbies and consumer goods, and also to communicate with their social networks. In this way, the Internet offers instrumental, informational and emotional support to older Internet users and becomes a significant medium for social support. Further, special online communities designed for older Internet users can assist them protect and improve themselves by providing social support. Since online communities offer leisure activities and a large social network to their users, participation by the elderly in those communities can increase their well-being (Nimrod, 2009).

Wright (2000) studied the impacts of participation in online support groups and communities on the psychological well-being of older people. The study was conducted with 136 older computer users who attend to SeniorNet Online webpage. Of them, 86% of the respondents stated that they use the Internet daily and spent approximately 17 hours per week online. The findings of the study showed that the stress level of older people who participated in online support groups decreased and this had a positive impact on the psychological well-being of older computer users. The study revealed that participation in online communities strengthen the social relations of the elderly and older Internet users who spent more time on the Internet are more satisfied with their support networks than those who spent less time.

Computer and Internet use can improve the quality of life older people by affecting psychological factors which determines QOL. As Brown (2004) states “personal growth, cognitive competence, efficiency and adaptability, level of dignity, perceived independence; social competence, control, autonomy, self-efficacy or self-mastery and optimism-pessimism” are among the psychological factors which determine the QOL for the elderly. Old age is associated with physical impairments and decreasing mobility. Shapira, Barak, and Gal (2007) point out that some services and applications such as online shopping, banking, gaming and learning can assist elderly to cope with physical impairments. Henke (1999) also suggests that online services and applications directly contribute to independence for the elderly. Computer and Internet use improve QOL of the elderly by empowerment and also by supporting them to cope with mental and physical impairments.

Among the studies which investigate the relationship between psychological factors improving the QOL of the elderly and computer use, Karavidas, Lim, and Katsikas (2005) studied the effect of computer knowledge, anxiety and self-efficacy on life satisfaction of older Internet users. The study sample included 222 older Internet users aged 53-88. The respondents were all members of computer clubs in Florida. As the findings indicated, there was a positive relationship between older Internet users’ knowledge of computers and the Internet, their general self-efficacy and life satisfaction. Moreover, computer use had a positive impact on life satisfaction through increased independence, maintenance of social networks, and access to health-related information.

Erickson and Johnson (2011) studied the relationship between Internet use and well-being of the elderly. The study sample consisted of 122 older Internet users aged 60 and over. The

authors analyzed the correlations between frequency and patterns of Internet use, well-being and demographic characteristics. As results suggested, significant correlations existed between the three groups of measured variables. Controlling for demographic differences, Internet use and self-efficacy remained significantly related. In addition, older Internet users who used the Internet more frequently had higher perceptions of self-efficacy than those who used the Internet rarely or not at all.

Werner, Carlson, Jordan-Marsh, and Florence (2011) using the data of randomized-controlled "the Well Elderly II" intervention study, examined the relationship between demographic, psychosocial, health-related variables and well-being. The participants of the study were recruited from senior centers, senior housing complexes, and retirement communities and included 460 elderly aged 60 and over. According to the findings of the study, computer and e-mail use had a positive effect on the psychological functioning and well-being of the elderly. In other randomized controlled intervention study, Slegers, Van Boxtel, and Jolles, (2008) examined the causal relationship between computer use, psychical, emotional and social well-being, development and activity, and autonomy. The results showed no relationship between Internet use and psychological functioning and well-being of elderly.

Shapira et al. (2007) explored the impact of Internet use and training on the sense of empowerment and well-being of seniors who attend day care centers for the elderly or reside in nursing homes. They carried out a quasi-experimental research and conducted a computer and Internet training course for 22 older adults (mean age of 80) in the intervention group. They took a computer and Internet course while 26 older adults in the comparison group engaged in other activities. Physical function, life satisfaction, depression, loneliness and self-control scores of older participants in both groups were measured at pre- and post-intervention four months later. In addition, semi-structured interviews were conducted with older participants who completed the computer and Internet course. According to the results of the study, except for physical function, older adults in the intervention group increased their scores in all measurements. On the other hand, scores of comparison group decreased in all measures. The researchers concluded that computer and Internet use improves well-being and sense of empowerment of the elderly by affecting interpersonal interactions and developing cognitive functioning, sense of control and independence.

In a similar study carried out in a residential home care unit for the elderly, Chaumon, Michel, Bernard, and Croisile (2014) investigated the effect of ICTs on the quality of life of elderly residents. The effect of computer use on self-esteem and the social integration level of the residents, perceptions on their social bonds (with family, other elderly in the care unit, and staff), and participation to social activities were investigated by employing semi-structured interviews and longitudinal observation. The study included 17 elderly residents (mean age of 87) who experience functional losses, and therefore were required to live in long-term care. According to the findings of the study, computer use had a positive effect on autonomy, self-efficiency of reaction, psychological empowerment and rehabilitation of some functions of these residents and improved their QOL.

Zhang and Umemero (2012) studied the perceived usefulness and attitude towards computers on the hedonic and eudemonic well-being of elderly in ICT use. As results indicated, perceived usefulness and daily life well-being were important predictors of both hedonic and eudemonic well-being in ICT usage. On the contrary, self-efficacy was a unique predictor of eudemonic well-being in ICT usage.

Xie (2007) examined the impact of the Internet use on the well-being of elderly Chinese. Thirty-three older Chinese, who were current or former students of a senior-oriented computer training organization based in Shanghai, were interviewed. The findings indicated that Internet training is positively associated with the well-being of older Chinese. Internet learning and use made the post-retirement lives of these older Chinese more meaningful and improved their positive self-evaluations.

Firth and Mellor (2009) conducted research to understand the impact of Internet use over a 12-month period on novice Internet users over the age of 65. The research addressed six

research hypotheses including 1) personal well-being, 2) positive affect, 3) self-esteem, 3) optimism, 4) social connectedness, and 5) level of need for social assurance. After 12 months of supported use of the Internet, there was no significant difference on any of the measured scales for the Internet group. Contrary to quantitative findings, the qualitative data indicated that computer use was a positive experience with new levels of connectedness to family, friends and football teams and exciting learning challenges. Brown (2004) compared the self-esteem and life satisfaction level of older adults who attended the SeniorNet computer training program and those who did not attend. After the completion of the training program, life satisfaction and self-esteem levels of both control and experimental groups showed a slight increase, however, it was not statistically significant. Therefore, it could not be inferred that computer training improved life satisfaction of older adults. Similarly, Dorin (2007) did not find a significant difference between life satisfaction levels of older adults who participated in online training program and those who did not. Elliot, Mooney, Douthit, and Lynch (2013) explored the impact of ICT use on the mental health and well-being of older adults by analyzing the data from the first wave of the National Health and Aging Trends Study (N = 6,443). According to the results of the study, there was no direct relationship between ICT use, well-being, and mental health of older Internet users. Nevertheless, it was suggested that ICT use might protect older adults who have health problems against depressive symptoms.

The association between participation to leisure activities and QOL of the elderly has been investigated in many studies and it was found that participation to leisure activities improves their QOL (Fernandez-Ballesteros, Zammaron & Ruiz, 2001; Heo, Stebbins, Kim, & Lee, 2013; Hribernik & Mussap, 2010; Nimrod & Adoni, 2006; Thang, 2005). Heo, Kim, and Won (2011) suggest that Internet use is a significant leisure activity for older people and satisfaction with Internet use can have an impact on the well-being of the older individual. They conducted a study which explored the relationships between leisure satisfaction of the elderly and their Internet use tendencies. According to the findings of the study, older persons who use the Internet more frequently are satisfied with their leisure activities which supported the association between Internet use and well-being.

Koopman-Boyden and Reid (2009) explored the impact of Internet and e-mail use on the well-being of older Internet users aged 65-84. They found that there was a significant positive association between Internet and e-mail use and the well-being of older Internet users. It was also found that Internet and e-mail use are positively associated with self-rated health, leisure participation, leadership, and well-being.

The studies on the Internet use of the older population generally tend to homogenize the elderly and neglect differences based on age, gender, ethnicity, socio-economic and health status. Nevertheless, some studies focused on specific groups of older Internet users. Khvorostianov, Elias, and Nimrod (2011), for example, studied the impact of Internet use on the coping process to immigration in later life and quality of life of elderly immigrants. The sample of the study included 32 Jewish elderly immigrants who migrated to Israel from the Former Soviet Union. According to the data obtained from semi-structured interviews, elderly Jewish immigrants use the Internet in order to maintain their health, to nurture professional interests, to maintain and extend social networks, to appreciate their past, and to enjoy leisure. Thus, it was seen that Internet use enabled these elderly Jewish immigrants to protect their self-worth and improve their QOL. It also helped them cope with the difficulties and losses of aging and immigration. In another study on a specific group of older Internet users, Smith (2005) explored the impact of computer use on the life satisfaction of senior religious sisters and compared the life satisfaction levels of those who regularly use the computer and those who do not. No difference was found between the life satisfaction levels of the two groups of senior religious sisters. Nevertheless, it was reported that over time they developed a positive attitude towards the computer.

Chen and Persson (2002) explored the differences in psychological well-being between older Internet and non-Internet users, and older and younger Internet users. The findings indicated that older Internet users have higher psychological well-being level than non-users. However, no

relationship was found between average Internet use duration and psychological well-being level of older and younger Internet users.

Dickinson and Gregor (2006) reviewed some articles suggesting that computer use has a positive impact on the QOL of the elderly. They propose these studies have faulty results due to methodology problems and that computer use has no positive impact on the QOL of the elderly. However, they did not include the qualitative studies which yielded positive results and they reviewed only a limited number of studies. Additionally, the majority of studies that investigate the relationship between Internet use and QOL of the elderly have been carried out in the past decade and were not included in their review study.

As the review of the studies indicates, the functional use of computer and Internet improves the life quality of elderly. This review included 25 studies. Of these, 15 studies showed that there is a significant relationship between Internet use and QOL for the elderly whereas no relationship was found in other studies. However, as stated by some researchers (Chen & Persson, 2002; White et al., 1999, 2002) the scores of participants on well-being measurements were already high at the beginning of the intervention leading to a “ceiling effect”, and no statistically significant results were obtained after intervention. Additionally, studies which used both quantitative and qualitative methods yielded different results. In cases where empirical results were inconclusive, qualitative data were supportive of the positive effect of Internet use on the quality of life of the elderly.

## 4. Conclusion and Recommendations

In order to develop sound public policies for the elderly in our aging societies, it is crucial to understand how older people evaluate their life situations and which factors determine and improve their quality of life. In this context, interdisciplinary and large scale studies are required in order to explore the impacts of information and communication technologies on the QOL of the elderly.

This review study aimed to understand the impact of computer and Internet use on the QOL of the elderly through providing a comprehensive perspective on the current state of knowledge on this subject of study. According to the findings of this study, computer and Internet use can improve the QOL of the elderly by decreasing their loneliness and social isolation, providing social support and leisure activities, enhancing their self-efficiency and perception of self-control, and integrating them into society. Thus, development of proper policies encouraging older adults to use the computer and Internet is vital in order to prevent their exclusion from society and to enhance their quality of life.

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