Utilizing ICT to prevent loneliness and social isolation of the elderly. A literature review

Qingyun Fan
University of Jyvaskyla, Finlandia
qingyun.fan@chydenius.fi

Received: 31/01/2016
Revised: 23/02/2016
Accepted: 25/05/2016
Available online: 01/07/2016

Abstract
Ageing of the population is a worldwide phenomenon. Numerous ICT-based solutions have been developed for elderly care but mainly connected to the physiological and nursing aspects in services for the elderly. Social work is a profession that should pay attention to the comprehensive wellbeing and social needs of the elderly. Many people experience loneliness and depression in their old age, either as a result of living alone or due to a lack of close family ties and reduced connections with their culture of origin, which results in an inability to participate actively in community activities (Singh & Misra, 2009). Participation in society would enhance the quality of life. With the development of information technology, the use of technology in social work practice has risen dramatically.

The aim of this literature review is to map out the state of the art of knowledge about the usage of ICT in elderly care and to figure out research-based knowledge about the usability of ICT for the prevention of loneliness and social isolation of elderly people.

The data for the current research comes from the core collection of the Web of Science and the data searching was performed using Boolean? The searching resulted in 216 published English articles. After going through the topics and abstracts, 34 articles were selected for the data analysis that is based on a multi approach framework. The analysis of the research approach is categorized according to some aspects of using ICT by older adults from the adoption of ICT to the impact of usage, and the social services for them. This literature review focused on the function of communication by excluding the applications that mainly relate to physical nursing. The results show that the so-called ‘digital divide’ still exists, but the older adults have the willingness to learn and utilise ICT in daily life, especially for communication. The data shows that the usage of ICT can prevent the loneliness and social isolation of older adults, and they are eager for technical support in using ICT. The results of data analysis on theoretical frames and concepts show that this research field applies different theoretical frames from various scientific fields, while a social work approach is lacking. However, a synergic frame of applied theories will be suggested from the perspective of social work.

Keywords: ICT, older adults, loneliness, social isolation.

Resumen
El envejecimiento de la población es un fenómeno mundial. Se han desarrollado numerosas soluciones basadas en las Tecnologías de la información y la comunicación (TIC) para el cuidado de ancianos, pero concentradas principalmente en los servicios relacionados con aspectos fisiológicos y de enfermería. El Trabajo Social es una profesión que tiene que prestar atención al bienestar integral y a las necesidades sociales de las personas mayores. Muchas personas sufren soledad y depresión en la vejez, ya sea como resultado de vivir solas o debido a la falta de lazos familiares y a la reducción de las conexiones con su cultura de origen. Todo ello desemboca en una incapacidad para participar en las actividades comunitarias (Singh y Mishra, 2009). La participación en la sociedad mejoraría su calidad de vida. Con el desarrollo de la tecnología de la información, su uso en la práctica del Trabajo Social se ha visto incrementado notablemente.

El objetivo de esta revisión bibliográfica consiste en trazar el estado actual del conocimiento sobre el uso de las TIC en el cuidado de las personas mayores y saber cuál es el estado de la investigación acerca de la capacidad de uso de las TIC para la prevención de la soledad y el aislamiento social de las personas de edad avanzada. Los datos de esta investigación provienen de la colección básica de la Web of Science, y su búsqueda se ha realizado con operadores «booleanos», cuyo resultado ha sido el hallazgo de 216 artículos publicados en inglés. Después de revisar los temas y resúmenes, se seleccionaron 34 artículos para el análisis de datos en el marco de varios enfoques. El análisis de los enfoques de investigación se clasifica de acuerdo con el proceso de acceso a las TIC por las personas mayores y la adopción de las mismas para su uso, y el servicio social que se les presta a ellos. Esta revisión bibliográfica se centró en la función de la comunicación, excluyendo las aplicaciones que se relacionan principalmente con la enfermería física. Los resultados muestran que, aunque todavía existe la llamada «brecha digital», las personas mayores tienen la voluntad de aprender...
Quingyun Fan

Utilizing ICT to prevent loneliness and social isolation of the elderly. A literature review

Introduction

Ageing of the population is a worldwide phenomenon. By 2050, 22% of the world’s population will be aged 60 or over (WHO, 2012). Social work as a profession should pay attention to the comprehensive wellbeing and social needs of older adults. With the development of information technology, the use of technology in social work practice has risen dramatically (Parker-Oliver & Demiris, 2006). Numerous ICT-based solutions have been developed to counter ageing-related challenges but mainly for the physiological and nursing aspects in the services for the elderly. Many people experience loneliness and depression in their old age, either as a result of living alone or due to a lack of close family ties and reduced connections with their culture of origin, which results in an inability to participate actively in community activities (Singh & Misra, 2009). A common understanding in many cultures holds that active participation in society would enhance the quality of life. The relational understanding of wellbeing highlights the positive effect of human activity and participation in local communities and society (Hirvilammi & Helne, 2014). Considering the physical limitations of elderly, online communication might be an option for the elderly to keep connected with people and the community. This study figures out what kind of research-based knowledge is available concerning the question of whether or not the loneliness and social isolation of older adults can be prevented through the usage of ICT. Based on these results, the applicability of ICT is reflected on as a tool of social work practice with the elderly in various vulnerable situations. This provides evidence of what the needs of social work practice are to prevent the loneliness and social isolation of the elderly.

ICT has been developing rapidly in the past decade. Still, research about the usage of ICT by seniors is limited. As such, there is limited empirical research on this topic. A literature review is used to produce a description on the state of existing knowledge (Machi & McEvoy, 2009). The first focus of the research review is put upon the motivation to use ICT, under which conditions the older adults have the willingness to access ICT and what inspires or encourages them to use ICT. Also, knowledge concerning the barriers for older adults who have the motivation to use ICT will be analysed. On the basis of the result from these two questions, the impact of using ICT among older adults will be summarised in order to find a way to prevent the loneliness and social isolation of older adults through the usage of ICT. Finally, the data analysis will find out which kinds of theories and theoretical concepts are applied to analyse older adults using ICT in order to suggest a theoretical framework for the following research of this topic.

1. Data

A literature search was performed at the end of October, 2015 from the core collection of the Web of Science, an online subscription-based scientific citation indexing service maintained by Thomson Reuters. The research review was limited to English language articles (no books or other types of publications were included). There was no time limitation to the data search. A set of 34 articles (Figure 1) were selected as data for the current research. An advanced search has been performed with two Boolean operators from...
the core collection of the Web of Science. The Boolean operator allows the searching strategy to be specified and limited. Articles were included in the data if (a) the sample populations were aging people, (b) the focus was on the usage of digital equipment among elder people or the social services provided seniors with the knowledge of how to use digital equipment for communication functions and (c) the outcome related to the social interaction of elderly people.

The first Boolean operator was \( TI = (\text{"information society" or digital or ICT or virtual or internet technology}) \) and \( TI = (\text{elderly or seniors}) \). The data search formula was composed by the title (TI). Based on the previous study, the topics of the data search were as follows: information society, as a phase, digital, ICT, virtual or internet technology. The search resulted in 39 published articles. After going through all the topics and abstracts, 14 articles were selected. Due to a lack of results, a second Boolean operator was created: \( TI = (\text{"information society" or digital or ICT or virtual or internet technology}) \) and \( TI = (\text{older}) \). The result of the second search comprised 177 published articles. Based on the topic and abstract after ranking by the most cited, 9 articles were selected from the newest published list and by the same process 11 articles were selected for the research review. The data search resulted in the 34 newest and most cited and topically most relevant English peer-reviewed articles which could hopefully provide data to answer the research questions.

A multi-approach framework was used for the data analysis, which was thematically categorised according to the research contents related to the various steps in the process of accessing ICT by older adults. The themes in the research articles were categorised into four main groups (see Figure 2): ICT adoption, impacts on quality of life, the support of social services and theories used in articles. The usage, the motivation and willingness were analysed to figure out the older people’s attitudes to ICT. In the disadvantages of ICT adoption by older adults could be found the limitations of older adults which restricted their experience of ICT utilisation.

After looking at the data using the above approaches, the data analysis focused on the social services which have been provided to support older adults in using ICT. These services contained ICT innovations for older adults and the projects offered orientation for using ICT that was targeted at older adults.
2. Results

2.1. Overview of the data

A summary of the knowledge from the data which answer to the research question shows in Table 1. Although the language of the articles was English, it is significant that most of the researches were conducted in developed countries which correspond to the imbalance development of ICT in different regions. The first article was published in 2006 (Lam & Lee, 2006), which was a longitudinal study of internet adoption by older adults. It was the period when SNS (social networking sites) were blooming after the foundation of Facebook in 2004 and Twitter in 2006.

The majority of the analysed articles were based on quantitative data (n = 20, 59%). Three articles (Godfrey & Johnson, 2009; Lia Hern, Modesta, Beni, & O Omez-Zú, 2009; Gustafsson et al., 2015) used both quantitative and qualitative methods. In the three articles, the impact factors of research questions were analysed by a quantitative method, but a qualitative method was applied to interpret the results. The concept of digital divide refers to «the social, economic, and demographic factors that exist between individuals who use computers and those who do not» (Cresci & Jarosz, 2010). The articles had different perspectives regarding the usage of ICT among older adults, but a common aim of the researches was to prompt the wellbeing and quality of life of older adults by bridging the gap of the so-called «digital divide». Demographic factors have been widely demonstrated to have an important impact on the usability of ICT, such as gender, age and education. In some articles, race or ethnicity were considered a factor (Cresci, Yarandi & Morrell, 2010). Based on the analysis of the statistical data that was presented in some of the articles, younger age, higher education level, more wealth, better health and literacy are more involved in the use of ICT. The rank of the above-mentioned demographic factors differed between the studies, and it still remains uncertain as to which factors have the foremost influence. Besides the demonstrated factors, the inadequacy of knowledge on using ICT had always been reported as a main reason for the lack of usage of ICT among elderly people.

Gender was an important factor in many of the published articles. The results were also somewhat contradictory, for example, some quantitative researches showed that men are more active in using ICT (Pan & Jordan-Marsh, 2010; Agudo Prado, Pascual Sevillano, & Fombona Cadavieco, 2012; Näsi, Räisänen, & Sarpila, 2012), whereas some qualitative researches focused on females as the main subject of research (Lin, Tang, & Kuo, 2012; Tsai, Shillair, Cotten, Winstead, & Yost, 2015). There was a common understanding that men would have better cognition on technical knowledge but that females would be more eager to connect with families. But, there was no evidence that men do not need ICT or that they do not need a service on learning to use ICT. Further studies could involve more male participants in this situation, and studies on the ICT adoption of older men could be
<table>
<thead>
<tr>
<th>Article (time order)</th>
<th>Country of research focus</th>
<th>Research method</th>
<th>Purpose/ manner of ICT usage</th>
<th>Target group of the elderly</th>
<th>Usefulness of ICT against loneliness?</th>
<th>Social Work practice relevance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lam &amp; Lee, 2006</td>
<td>Hong Kong, China</td>
<td>Quantitative</td>
<td>Digital inclusiveness</td>
<td>Age 55+, N ≅ 1000</td>
<td>Outcome expectations on usage intention</td>
<td>Support and encouragement in the information of self-expectation</td>
</tr>
<tr>
<td>Sokoler &amp; Svensson, 2007</td>
<td>Sweden</td>
<td>Qualitative</td>
<td>Social interaction</td>
<td>Age 55+, N = 10</td>
<td>Technology design for social challenges</td>
<td>Non-stigmatisation</td>
</tr>
<tr>
<td>Peacock &amp; Künnemund, 2007</td>
<td>Germany</td>
<td>Quantitative</td>
<td>Internet access and motivation</td>
<td>Data from a survey cover 15 European countries Age 55+, N = 5091</td>
<td>Lacking facilities and knowledge are part of the reasons of older citizens who are offline</td>
<td>Promote technical support in community and more ICT facilities should provide for public service</td>
</tr>
<tr>
<td>Fokkema &amp; Knipscheer, 2007</td>
<td>Netherlands</td>
<td>Quantitative</td>
<td>Decrease loneliness</td>
<td>Age average 65, N=15</td>
<td>The more social functions of the internet are used the more loneliness could decline</td>
<td>Provide social service on using ICT for social functions</td>
</tr>
<tr>
<td>Carmichael, Newell &amp; Morgan, 2007</td>
<td>UK</td>
<td>Quantitative</td>
<td>Usable technology</td>
<td>Video recordings on seniors using ICT</td>
<td>Meeting and interacting with older users of ICT should be implied in design process to collect their needs</td>
<td>Understanding the needs of older users in using ICT could benefit the social work service for elderly people</td>
</tr>
<tr>
<td>Sum et al., 2008</td>
<td>Australia</td>
<td>Quantitative</td>
<td>Social capital and wellbeing</td>
<td>Age 55+, N = 222</td>
<td>Internet can be helpful when used with awareness</td>
<td>Provide guide for using ICT</td>
</tr>
<tr>
<td>Godfrey &amp; Johnson, 2009</td>
<td>UK</td>
<td>Review</td>
<td>Information need</td>
<td>Research on older people’s information needs</td>
<td>How the use of informal network support by technology can benefit older people</td>
<td>Using emerging technology improves the digital network support for older persons</td>
</tr>
<tr>
<td>Lia Hern et al., 2009</td>
<td>Spain</td>
<td>Quantitative</td>
<td>ICT adoption, learning of using ICT</td>
<td>Age 65+, N = 13  (Quantitative) Age 65-70, N = 7 (Qualitative)</td>
<td>Usability, attitudes, experience and perceived benefits are key aspect of older people’s ICT adoption</td>
<td>Adjustments of the technology based on gerontology are needed</td>
</tr>
<tr>
<td>Cresci &amp; Jarosz, 2010</td>
<td>USA</td>
<td>Qualitative</td>
<td>Proving health and wellbeing</td>
<td>Adults age 21-61, (N = 5) Age 62+, (N = 30)</td>
<td>Lacking knowledge and access to ICT</td>
<td>Community-university partnership</td>
</tr>
<tr>
<td>Jung et al., 2010</td>
<td>USA</td>
<td>Quantitative</td>
<td>Motivation</td>
<td>Low income immigrant seniors, N = 91</td>
<td>Benefit from enrol in the Cyber-café for social support etc.</td>
<td>Organize learning events for vulnerable groups</td>
</tr>
<tr>
<td>Article (time order)</td>
<td>Country of research focus</td>
<td>Research method</td>
<td>Purpose/ manner of ICT usage</td>
<td>Target group of the elderly</td>
<td>Usefulness of ICT against loneliness?</td>
<td>Social Work practice relevance?</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>----------------------------</td>
<td>--------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Cresci, Yarandi &amp; Morrell, 2010</td>
<td>USA</td>
<td>Quantitative</td>
<td>Motivation</td>
<td>Age 65+, N = 1410</td>
<td>Significant differences or not of demographic and health-related factors on user</td>
<td>Focus on seniors with special needs for using of ICT</td>
</tr>
<tr>
<td>Pan &amp; Jordan-Marsh, 2010</td>
<td>China</td>
<td>Quantitative</td>
<td>Internet adoption</td>
<td>Age 50-81, N = 374</td>
<td>The financial cost and lacking of suitable facilities limited the Chinese seniors’ access to the Internet. They could not get technical support from family due to the living distance, they would like peer group support</td>
<td>Promote senior centred internet facilities which are low cost Organise a peer group when learning to use internet facilities</td>
</tr>
<tr>
<td>B. De Schutter, 2010</td>
<td>Belgium</td>
<td>Quantitative</td>
<td>Digital game adoption</td>
<td>Age 45-85, N = 124</td>
<td>Digital games could bring gratification for seniors. Social interaction is an important predictor of how long they will play</td>
<td>Introduce seniors to play some casual games with social interaction.</td>
</tr>
<tr>
<td>Ordonez, Yassuda &amp; Cachioni, 2011</td>
<td>Brazil</td>
<td>Quantitative</td>
<td>Computer learning</td>
<td>Age 60+, N = 42</td>
<td>Cognition can be improved by learning new knowledge or using a new tool such as access to internet</td>
<td>Enabling to provide new services for the elderly</td>
</tr>
<tr>
<td>Chen et al., 2011</td>
<td>Taiwan, China</td>
<td>Quantitative</td>
<td>Learning, technology services</td>
<td>Age 61-70, N = 450</td>
<td>Digital broadband network technology services provided via television</td>
<td>The digital facilities could implied in the seniors’ house</td>
</tr>
<tr>
<td>Näsi, Räsänen &amp; Sarpila, 2012</td>
<td>Finland</td>
<td>Quantitative</td>
<td>Internet use</td>
<td>Age 60-79, N = 542</td>
<td>Leisure activities using the internet is a positive correlation among Finnish seniors</td>
<td>Improvement of social work service by using ICT</td>
</tr>
<tr>
<td>Lin, Tang &amp; Kuo, 2012</td>
<td>Taiwan</td>
<td>Qualitative</td>
<td>Social intervention, ICT leaning</td>
<td>Age 40-66 women, N = 28</td>
<td>Learning though social support</td>
<td>Organise or promote peer support group</td>
</tr>
<tr>
<td>O’Mara, 2012</td>
<td>Australia</td>
<td>Qualitative</td>
<td>Wellbeing</td>
<td>Elderly women from the Vietnamese community, N = 38</td>
<td>Using digital technology to improve communication</td>
<td>Organise or promote peer support group, enabling seniors to use online resources</td>
</tr>
<tr>
<td>Article (time order)</td>
<td>Country of research focus</td>
<td>Research method</td>
<td>Purpose/ manner of ICT usage</td>
<td>Target group of the elderly</td>
<td>Usefulness of ICT against loneliness?</td>
<td>Social Work practice relevance?</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------</td>
<td>-----------------</td>
<td>-------------------------------</td>
<td>----------------------------</td>
<td>--------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Ng, Lim, Niti &amp; Collinson, 2012</td>
<td>Singapore</td>
<td>Quantitative</td>
<td>Digital mobile phone use</td>
<td>Age 55+, N = 871</td>
<td>Digital mobile phone users might have lower risks of cognitive decline</td>
<td>Using digital phone may have an independent facilitating effect on global and executive functioning</td>
</tr>
<tr>
<td>Agudo Prado, Pascual Sevillano &amp; Fombona Cadavieco, 2012</td>
<td>Spain</td>
<td>Quantitative Qualitative</td>
<td>Learning, healthy living</td>
<td>Elderly, N = 215</td>
<td>Seniors are using digital tools for education, information, communication and entertainment</td>
<td>Most seniors access internet form public service, more ICT facilities should be provided for elderly service</td>
</tr>
<tr>
<td>Niehaves &amp; Plattfaut, 2013</td>
<td>Germany</td>
<td>Quantitative</td>
<td>Internet adoption</td>
<td>Age 65+, N = 150</td>
<td>Age-related digital divide prevents them using ICT to enhance life quality</td>
<td>Enabling to provide new services for the elderly</td>
</tr>
<tr>
<td>Bobillier Chaumon et al., 2013</td>
<td>France</td>
<td>Qualitative</td>
<td>Quality of life</td>
<td>Mean Age 87, N = 17</td>
<td>Improve intellectual and interactional capacities</td>
<td>Apply ICT facilities for a service for seniors who have lost intellectual and interactional capacities</td>
</tr>
<tr>
<td>Choi &amp; Dinitto, 2013</td>
<td>USA</td>
<td>Quantitative</td>
<td>Internet using, attitudes towards use of internet or computer</td>
<td>Recipients of home-delivered meals, N = 980 (78% Age 60+)</td>
<td>Discontinuing internet use due to cost and disability and the lack of technology</td>
<td>Reduce the digital divide among individuals</td>
</tr>
<tr>
<td>Heart &amp; Kalderon, 2013</td>
<td>Israel</td>
<td>Quantitative</td>
<td>Health-related ICT adoption</td>
<td>Age 60+, N = 123</td>
<td>ICT can improve the quality of life although the elderly are not ready to use it.</td>
<td>Health-related ICT should be simple, special training for specific personal and cultural characteristics is needed</td>
</tr>
<tr>
<td>Allaire et al., 2013</td>
<td>USA</td>
<td>Quantitative</td>
<td>Wellbeing</td>
<td>Age 63-92, N = 140</td>
<td>Playing digital games may serve as a positive activity associated with successful aging</td>
<td>Introduce some digital games suitable for seniors to use</td>
</tr>
<tr>
<td>Levy, Janke &amp; Langa, 2014</td>
<td>USA</td>
<td>Quantitative</td>
<td>Access to online information of medical record</td>
<td>Age 65+, N = 2408</td>
<td>Less use of online healthy information associated with low health literacy</td>
<td>Bridge the gap of age related digital divide</td>
</tr>
<tr>
<td>Article (time order)</td>
<td>Country of research focus</td>
<td>Research method</td>
<td>Purpose/ manner of ICT usage</td>
<td>Target group of the elderly</td>
<td>Usefulness of ICT against loneliness?</td>
<td>Social Work practice relevance?</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>-----------------</td>
<td>---------------------------------------------------</td>
<td>------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Bob De Schutter, Brown &amp; Abeele, 2014</td>
<td>USA</td>
<td>Qualitative</td>
<td>Media adoption</td>
<td>Age 49-73, N = 35</td>
<td>Culture, gender and knowledge are factors that impact on the adoption of digital games for older players</td>
<td>Consider the differences among seniors when providing services for them though ICT</td>
</tr>
<tr>
<td>Wu, Dammée, Kerhervé, Ware &amp; Rigaud, 2015</td>
<td>France</td>
<td>Qualitative</td>
<td>ICT adoption</td>
<td>Age 63-88, N = 23</td>
<td>Older adults adopt ICT to fit in with the society, they need technical support</td>
<td>Provide technical support in the local community and organise peer support</td>
</tr>
<tr>
<td>HUNTER, 2015</td>
<td>UK</td>
<td>Qualitative</td>
<td>Communication and family relationship</td>
<td>Age 55-75, N = 25</td>
<td>The use of ICT helps older migrants connect with home country but also brings more responsibilities</td>
<td>Provide support for migrants on social interaction in local community</td>
</tr>
<tr>
<td>Tsai, Shillair, Cotten, Winstead &amp; Yost, 2015</td>
<td>USA</td>
<td>Qualitative</td>
<td>Technological self-efficacy</td>
<td>Age 69-91, N = 21</td>
<td>Using tablets improve the quality of life, decreased feeling of loneliness and depression, increased independence and personal growth</td>
<td>Sharing the successful cases of using tables with the non-users to show helpfulness of ICT</td>
</tr>
<tr>
<td>Hill, Betts &amp; Gardner, 2015</td>
<td>UK</td>
<td>Qualitative</td>
<td>Enhance life activity and increase social network</td>
<td>Age 54-85, N = 17</td>
<td>Overcome physical barriers Reduce loneliness</td>
<td>Improving the welling of elderly people by using ICT</td>
</tr>
<tr>
<td>Hall, Bernhardt, Dodd &amp; Vollrath, 2015</td>
<td>USA</td>
<td>Quantitative</td>
<td>Improve quality of care and health outcome</td>
<td>Age 50-92, N = 225</td>
<td>Healthy digital divide is significant</td>
<td>Provide health education program to promote health information technology use</td>
</tr>
<tr>
<td>Gustafson et al., 2015</td>
<td>USA</td>
<td>Quantitative/ Qualitative</td>
<td>Quality of life among elderly people and their caregivers</td>
<td>Users of a ICT program N = 392</td>
<td>A program could improve the quality of life</td>
<td>Could be a demand for a ICT programme targeted to enhance the relationship between elderly people and their caregivers</td>
</tr>
<tr>
<td>Beer, Smarr, Fisk &amp; Rogers, 2015</td>
<td>USA</td>
<td>Quantitative</td>
<td>Recognition of virtual emotion</td>
<td>1. Age 18-26, N = 31 &amp; Age 65-85, N = 29 2. Age 18-28, N = 42 &amp; Age 65-85, N = 42</td>
<td>Older users show lower recognition of virtual emotion</td>
<td>The virtual services for seniors should pay more attention on virtual emotion design</td>
</tr>
</tbody>
</table>

Table 1. Summary of articles.
done beforehand. Another factor found in the articles was the relationship status of the female participants. They were mentioned as either «Grandma» or «Mom», which strongly implies the role of women in the family. Hence, the terms «Grandma» or «Mum» should be used carefully in further research of older adults using ICT as they should be respected as an individual and not just as some women in the family.

2.2. The information and communication technology adoption of older adults

The difference in the motivation has been shown to be the major category, after accessibility to the internet, that explains the ICT usage among the older adults (Peacock & Künemund, 2007). Basically, older adults have been facing two types of information and communication technology in daily life: one has been designed for the older adults and reflects the potential cognitive impairment and physical disabilities of them, and the other has been designed for the population in general without taking into consideration the age gap. The principle of ICT devised for older adults has been to help them live independently as long as they can without losing a connection with society (Choi & Dinitto, 2013) Prevention of social isolation has been seen to be the primary motivation for using ICT. Researches have illustrated that older adults have the desire to adopt the latest technology (Lin, Tang & Kuo, 2012) and interact with others via ICT (De Schutter, 2010). However, some of the older adults have been users of ICT already before retirement (Peacock & Künemund, 2007; Näsi, Räsänen & Sarpila, 2012; Tsai Shillair, Cotten, Winstead & Yost, 2015). The older adults have been inspired or encouraged by friends or relatives to start surfing the internet (Lam & Lee, 2006; Fokkema & Knipscheer, 2007; Peacock & Künemund, 2007; Sokoler & Svensson, 2007; Cresci & Jarosz, 2010; Cresci, Yarandi & Morrell, 2010; Agudo Prado, Pascual Sevillano & Fombona Cadavieco, 2012; Bobillier Chaumon et al., 2013; Niehaves & Plattfaut, 2013; Tsai, Shillair, Cotten, Winstead & Yost, 2015).

The ICT has been seen to provide a convenient and effective approach to communicate with others, and it also has assisted the older adults in receiving information that interests them. Especially the older adults who have been experiencing some illness gain benefit from the resources provided by peer groups, which are credible and updated regularly (Fokkema & Knipscheer, 2007; Cresci & Jarosz, 2010; Pan & Jordan-Marsh, 2010; Näsi, Räsänen, & Sarpila, 2012; O’Mara, 2012; Choi & Dinitto, 2013; Heart & Kalderon, 2013; Tsai, Shillair, Cotten, Winstead & Yost, 2015; Hall, Bernhardt, Dodd & Vollrath, 2015). The emotional support among peer group members has also been a positive impact of using ICT (Gustafson et al., 2015).

It has also been shown that there is an objective reason for using ICT, which motivates elderly people to learn to use these technologies. The older adults have sometimes had to use online technology to «do tax declaration and buy tickets» (Wu, Damnée, Kerhervé, Ware, & Rigaud, 2015) because there are often no other options. But they have gained also further knowledge of the internet after the experience of buying tickets and have started exploring other functions such as communication. Meanwhile, more online health information systems have been invented that older adults could benefit from but only if they would know how to use such sources (Levy, Janke & Langa, 2014; Hall, Bernhardt, Dodd & Vollrath, 2015).

According to the statistics from different regions, people aged over 55 have had lower exposure to ICT compared to other age group (Lam & Lee, 2006; Näsi, Räsänen & Sarpila, 2012; Tsai, Shillair, Cotten, Winstead & Yost, 2015; Wu, Damnée, Kerhervé & Ware, 2015). An obvious reason is the limitation of the cognitive and physical function of older adults. Other closely related factors have been found from the data of the current research, such as «not needed» or «not interested» (Fokkema & Knipscheer, 2007; Heart & Kalderon, 2013). A qualitative research (Wu, Damnée, Kerhervé, Ware & Rigaud, 2015) has indicated that some older adults are still unable to use ICT facilities due to the economic cost of the facilities and internet. They have also been worried about «breaking it» because of incorrect use. They were concerned about the cost of the security; some older adults were anxious about safety, and they were worried that others would «get their addresses» or other identity information. They were also worried that their human nature might be changed by ICT (idem). Even if they conquer the fear of economic and security danger, older adults have found that they could not receive good technical support in the
use of ICT. Lin, Tang & Kuo (2012) addressed the social supports for elderly women learning ICT and found that some elder women complained that their families were impatient to help them to use ICT. Although some relatives were happy to help, older adults reported that they could not understand the guidance from the younger generation because they did not understand the concepts or terms (Wu, Damnée, Kerhervé, Ware & Rigaud, 2015). Furthermore, to avoid the stigma which may be caused by being eager to use ICT, the older adults were afraid of being tagged as suffering from loneliness as they have the intention to use ICT for communication (Sokoler & Svensson, 2007).

2.3. Improving the quality of life through the use of ICT

Studies (Fokkema & Knipscheer, 2007; Hill, Betts & Gardner, 2015; Tsai, Shillair, Cotten, Winstead & Yost, 2015) have demonstrated that the usage of ICT can decrease the feeling of loneliness and social isolation. Evidence from the data showed that the usage of ICT can significantly improve and enhance the quality of life among older adults (Fokkema & Knipscheer, 2007; Bobillier Chaumon, Michel, Tarpin Bernard & Croisile, 2013; Heart & Kalderon, 2013; Niehaves & Plattfaut, 2013; De Schutter, Brown & Abeele, 2014; Gustafson et al., 2015; Sokoler & Svensson, 2007; Beer, Smarr, Fisk & Rogers, 2015; Tsai, Shillair, Cotten, Winstead & Yost, 2015; Wu, Damnée, Kerhervé, Ware & Rigaud, 2015) and that digital games can even lead to «successful aging» (Allaire, McLaughlin, Trujillo, Whitlock, LaPorte & Gandy, 2013). Firstly, the assistant function of ICT has been shown to offer older adults the opportunities and resources for independent living as long as they want (Cresci & Jarosz, 2010; Niehaves & Plattfaut, 2013; Sokoler & Svensson, 2007). This has not only been the desire of older adults themselves, but also that of the service agencies, because in the current situation of elderly care resources for institutional care have been lacking. Then the older adults can easily catch on to the rapidly updated information from the ICT devices, especially in regard to health related information. The health related information has usually been accessed from health-related internet sites (Heart & Kalderon, 2013) and the e-health service of the local authority (Hall, Bernhardt, Dodd, & Vollrath, 2015; Levy, Janke & Langa, 2014). Older adults who have been suffering chronic illness have the possibility to get specific information on their disease (O’Mara, 2012).

The articles included in the data have shown that the emotional needs of older adults have built up around them a significant focus on innovations, research and services for the elderly (Fokkema & Knipscheer, 2007; Allaire, McLaughlin, Trujillo, Whitlock, LaPorte & Gandy, 2013; Beer, Smarr, Fisk & Rogers, 2015; Hill, Betts & Gardner, 2015). As the out-migration of young people has become more common in several countries, the older generation sometimes have been left alone without enough emotional support due to social isolation, which leads to loneliness (Yamada & Teerawichitchainan, 2015). The sustained and effective social interaction with the assistance of ICT has produced a virtual social life for older adults, and especially those who have physical limitations or who live in remote regions.

From the perspective of the impact of using ICT, some target groups have been studied separately such as grandmothers, patients with chronic diseases and migrants. Migrants have benefitted from the services of ICT to maintain kinship in a foreign country (Georgiou, Ponte & Cola, 2013), and some researchers have presented that ICT could help the migrants back to their home country. However, Hunter (2015) came to a comprehensive conclusion based on a qualitative study: that the usage of mobile phone provides a convenient way for communication. This bond has also lead migrants to take more financial responsibility of taking care of the relatives in their home country. Because of the availability of online money transfer services, some migrants have needed to respond to the financial needs of their families right after they have called instead of sending money once per month (Hunter, 2015). This responsibility has brought pressure to the older migrants. Some of them confirmed during the interviews that they have been afraid even of answering phone calls from family members because they know that will be required to send money back home immediately (idem).

2.4. Social services and ICT

Over the past decades, no other innovations have had such significant impacts on working and li-
Quingyun Fan

Utilizing ICT to prevent loneliness and social isolation of the elderly. A literature review

In the context of rapidly changing environments as has information and communication technology (Holden, Bearison, Rode, Rosenberg & Fishman, 1999). Stemming from the rapid increase of ICT innovation, more social services have been expanding the digital services which can be accessed by internet. Several projects have been presented in the review data, which have addressed the assistive technologies like «@home» (Doukas, Metsis, Becker, Le, Makedon & Maglogiannis, 2011) as one such innovation. Monitoring technologies have also continued to develop steadily although these innovations have always been associated with ethical concerns; for example, «SWEET-HOME» is a monitoring innovative frame with an audio and video consultation setting (Robert et al., 2013). Considering the information, especially the communication function, «Leeds Link-Age Plus» (Godfrey & Johnson, 2009) has aimed to meet the requirement of information for older adults. «Elder Tree» (Gustafson et al., 2015) is a multifaceted intervention which has created an alternative role for older adults. The users can access services with «Elder Tree» while providing informal care for other older users. This innovation has led to a result that demonstrates a possibility to escape loneliness and reduce healthcare costs among older adults (Gustafson et al., 2015).

Based on the result of the adoption of ICT, the inadequacy of efficient technical supports has been the main reason that obstructing older adults from using ICT. Against this background, projects aiming to find a strategy for bridging the gap of the digital divide have been conducted for older adults. A female targeted project (Lin, Tang, & Kuo, 2012) created an orientation of internet surfing among older adults though social support. Some projects have indicated that older adults prefer to have peer support other than from a family member or a professional (Lin, Tang & Kuo, 2012; Niehaves & Plattfaut, 2013).

2.5. Theoretical approach in the studies on the elderly using ICT

Different theatrical approaches have been applied in the articles. The data analysis of theoretical knowledge has been formulated (see Figure 3) based on the process of the ICT adoption. Three separate layers were selected for the analysis: (1) the cognition and learning behaviour on the adoption of ICT, (2) the social interaction as the impact of the usage of ICT and (3) the theories from a broader social work perspective.

Cognition and learning theories have been the basic knowledge of innovation of ICT for older adults, and social services have aimed to advise older adults to use ICT. In Lam and Lee’s (2006) longitudinal study a theoretical model was developed based on social cognitive theory. The self-efficacy theory (Bandura, 1982) was used to study the impact of ICT on older adults’ quality of life (Hall, Bernhardt, Dodd, & Vollrath, 2015). The technology acceptance model (Davis, 1985) has been employed in two articles to explain individual technology usage beha-

Figure 3. Theoretical approaches of researches in regard to usage of ICT by older adults.
Quingyun Fan

Utilizing ICT to prevent loneliness and social isolation of the elderly. A literature review

Behaviour (Niehaves & Plattfaut, 2013) and to examine the determinants of Internet adoption behaviour (Pan & Jordan-Marsh, 2010). The following theories were also reviewed in the articles as a background to cognition and learning theories: reasoned action (Lam & Lee, 2006; Chen, Lu, Chen, & Liu, 2011; Niehaves & Plattfaut, 2013); technology acceptance theory (Niehaves & Plattfaut, 2013); theory of planned behaviour (Heart & Kalderon, 2013); and self-determination theory (Gustafson et al., 2015).

Social interaction has been the main consequence of using ICT, and social support theory has been implied in the research (Lin, Tang & Kuo, 2012) with aim to improve the social interaction of older adults. According to Hobfoll and London (1986), women have taken social support as a key resource because of their emotional cognition, and those women have been more willing to help others with communication skills that could enable their network. In the theoretical frameworks a significant shortcoming has been demonstrated in the theories in regard to the use of ICT by elderly people, especially in regard to the loneliness and social isolation of older adults as social phenomena are rarely illustrated. Instead, the psychological and sociological theories related to the cause of loneliness and social isolation of older adults have been studied in these articles from past decades. Until now, the theories have mostly been from disciplines other than social work. Empowerment has been a widely discussed social work theory. The fundamental understanding of empowerment has been the self-decision and self-achievement of the service users themselves. In a case study from the data, the self-empowerment training programmes have helped to mitigate cultural barriers with elderly women from Vietnam (O’Mara, 2012). Empowerment has been seen to be a strong support for bringing the gap of the digital divide.

3. Discussion

Based on the knowledge of ICT adoption, the research results related to the quality of life after using ICT are explored in three sections in regard to their needs. Given that the older adults would like to live as independently as long as possible (Blaschke, Freddolino & Mullen, 2009), it is evident that they then also have the need to receive information (Godfrey & John-son, 2009; Sum, Mathews, Pourghasem & Hughes, 2008). Furthermore, the need for emotional support is not always satisfied (Allaire, McLaughlin, Trujillo, Whitleck, LaPorte & Gandy, 2013; Lia Hern, Modesta, Beni & O Omez-Zü, 2009). Digital technology including ICT is constantly changing, which results in a variety of innovations and constant updates. The periods between releases of new operation systems are becoming shorter and shorter. For some of the older adults it is a challenge to gain some basic skills on the use of ICT facilities; the rapid changes in the operating systems are a burden. If the user does not frequently update their systems, the service providing companies might stop the support for the user’s current operating system. It is not only the operating systems which need to be often updated, even the applications need to be updated regularly. Sometimes the changes in the applications may confuse the older adults if they do not have the opportunity to get support from friends or relatives. From this viewpoint, the sorts of devices which target older adults with the functions of reaching information and making communication should be widely promoted. These devices should be easy to operate, not expensive and portable. More importantly, these devices should be compatible with the devices which are used by the friends of the older adults to communicate with each other.

Ethical standards are indispensable in social work research and practice. However, the discussion of ethical issues related to the usage of ICT by older adults is missing in the data of the present study. Ethical challenges are addressed in other research (Reamer, 2013) from the point of view of online social work practice. Specific ethical issues should pay attention to the environment of ICT which advocate an open and sharing atmosphere. Due to the features of ICT, the ethical issues such as how to keep the privacy and confidentiality of service users need to be clarified to protect both service users and social workers. Recently, monitoring technologies are combined with the ICT innovations, but these kinds of monitoring results in a variety of ethical concerns including in relation to privacy. The researchers always claim they have ethical concerns during innovation, but a detailed discussion of monitoring technologies needs to be explored.
4. Conclusion and limitation
This research review of the English language re-
search on older adults using ICT shows the fol-
lowing: the current knowledge of older adults’
adoption of ICT, ICT innovation targets on older
adults and the social services for support the
using ICT of older adults. In this research a the-
etorical framework is built which maps out the
social science theories that could be used by the
researchers of social services in regard to the use
of ICT by the elderly. Empowerment is much
more predominant for research and practices in
this field. According to Solomon (1976), empo-
werment is the guiding principle for service
users to access resources. Empowerment does
not attempt to drive the service users to the pro-
fessional level nor direct them to the goal made
and described independently by the social
workers; instead, older adults who have the willing-
ness to use ICT for daily life could find resour-
ces from the social services. Empowerment also
takes the service users as subjects who have their
own values, and as such the usage of ICT for get-
ing in touch with families and friends may be
seen as an implement of their social interaction
to prevent loneliness and social isolation. Fur-
thermore, these seniors could also be a resource
for others seniors who wish to learn to use ICT.
Hence, empowerment theory could be employed
to support further research and practice.

The analysis of the data demonstrates that the
usage of ICT for older adults can prevent their
loneliness and social isolation. The results of the
data analysis indicate that older adults have a po-
sitive attitude towards ICT and that they have the
need to use ICT for both subjective and objecti-
ve reasons. The lack of effective technical sup-
port stops them from using ICT, and they prefer
to have a step-by-step process where they can
gain the necessary skills and receive support
from their peer group. ICT provides a supple-
ment for the needs of older adults in their daily
life. Due to the advantages of ICT, it offers el-
derly people an opportunity to talk anytime and
anywhere. The users of ICT share health know-
ledge, rank local hospitals and doctors, search
for companions for shopping and travelling and
so on. However, the disadvantage of utilising
ICT is the spread of negative sentiment: the lack
of professional advice and the fact that most
users have no skills for dealing with the negative
sentiment of others and can only show their con-
cern. Professional social workers, who often ha-
ve not been invited to join the groups, should be
involved in the groups as their help is especially
needed in cases of emergency, such as when help-
ing with suicidal thoughts. Research which fo-
cuses on rural residents is still underdeveloped.
Houses in rural areas are decentralised, and the
younger generations in the family have often
moved out which results in the potential need of
ICT among older adults. As such, research and
the social services should pay more attention to
older rural adults.

The usage of ICT could enhance the commu-
nication of older adults, and the social interac-
tion could lead to a more active life. Based on
the result of the data analysis of this study, the ol-
der adults should be encouraged to use ICT and
related services are also needed. Although some
research such as the disengagement theory
(Cumming & Henry, 1961) claims it is natural
and acceptable for older adults to withdraw from
society. But the use of ICT may not only depend
on the choice of the seniors themselves: the
changeable society may also lead to different li-
festyles for seniors. Research on this topic, with
different results from different cultures and dif-
ferent genders, is not included in this study.

This is a context based literature review so far
as it does not cover all countries and languages.
As such, the conclusion from the data of this
study may not be applicable for a global context.
The language setting of the data collection limi-
ted the result of the literature search; for instan-
ce articles written in languages which have a lar-
ge number of native speakers, for example
Chinese, Arabic or Latin languages and so on,
are not reviewed in the current study. For instan-
ce, taking the world’s second large economy as
an example, China has seen a rapid growth in di-
gital development in the past decade and as such
needs to be studied in the future in the context of
this research. The use of ICT by the elderly is
growing but has not yet been studied from the
perspective of social services. Current resear-
ches indicate that the usage of ICT could im-
prove the life quality of older adults by enhancing
their social interaction and lessening their social
isolation.
5. References


198


