Abstract. Aging of population is an inevitable process by which the number of elderly people is increasing. Rapid development of information and communication technology (ICT) is changing basic needs of elderly people; therefore society should ensure opportunities for elderly to learn and use ICT in a way to manage their daily life activities and in this way enable them participation in the information and knowledge society. The purpose of the study was to find out whether elderly are acquainted with the advanced technology and to what extent they use it or they desire to use it. Within the single point study we interviewed 100 randomly selected elderly people from different geographical regions in Slovenia. Results showed the differences in the use of advanced technology by Slovenian regions; therefore in the future activities should be focused on organizing promotional and demonstrational activities including ICT courses to increase elderly’s motivation for ICT interaction.

Keywords. Elderly people, Information and communication technology (ICT), Advanced technology, Computer, World Wide Web (Internet)

Introduction

Prolonging the life is the most significant demographic phenomenon of modern society, which together with a reduction in fertility leads to the aging of population. The aging of the population is characterized by a growing proportion of the population aged 65 years and when the proportion exceeds 7 %, the population is aging. Population aging is basically a positive process, mainly caused by lower birth rates and lower mortality of elderly people [1]. According to United Nations in the year 2012 there were 810 million people aged 60 years or more in the world, which is 178 million more than in 2002 [2]. This trend is similar in Slovenia where in 1950 only 7 % of people were older than 64 years, in the year 1975 the number increased on 11 %, in the year 2007 Slovenia had 16 % of elderly people aged 64 years and it is expected that in

1 Corresponding Author: Email helena.blazun@uef.fi
the year 2050 the number will increase to 33 %. From this data it is obvious that by the year 2050 almost one third of Slovenians will be older than 64 years [3].

One of the main guidelines of the World Health Organization (WHO) is to introduce active aging as a lifelong process and to increase the awareness of cities and citizens to become friendlier to elderly people and enable them equal inclusion into the society [4]. ICTs have a great potential to support elderly people in performing their everyday activities i.e. to stay in touch with family and friends, to perform activities related to their social inclusion, to maintain their health and social care, etc. [5]. The society should ensure the possibilities and opportunities for elderly people to learn and use ICT skills and in this way enable elderly people equal integration into the information and knowledge society which will, through personal empowerment, increase their QOL [6].

Nowadays computer literacy is becoming more and more important since it is also influencing the quality of life of elderly people. Additionally, WHO concluded that there is a considerable disparity between developed and developing countries in exploitation of advanced ICT for elderly people’s better quality of life [4]. Already in the year 1999 White, McConnell, Clipp, Bynum, and Teague performed a study among elderly people who were living in elderly homes and had the opportunity to learn how to use World Wide Web (WWW) (Internet) and found out that after the ICT training elderly were less lonely and more social [7]. Similarly, the reduction of level of loneliness of elderly people living in elderly homes after ICT intervention was proved one decade later, which indicates that ICT could have positive effects on elderly people’s well-being [8]. However, it is possible that ICT is not useful for everyone, which was confirmed in the study performed by Persson and Yiwei who were not able to statistically prove any correlations between time spent on the WWW and psychological well-being of elderly people [9]. The study still showed that learning and using WWW could make differences in elderly people’s lives.

For the society to be able to influence elderly people’s ICT engagement for their better quality of life we need to start by knowing and understanding the current state of ICT use by elderly people, the level of their motivation to learn and use ICT and mostly we need to acknowledge their needs and wishes regarding the ICT use. Therefore the purpose of this study was to find out whether the elderly people are acquainted with advanced technology in different regions in Slovenia, to what extent they use advanced technology or they wish to use it and where and from whom they get support and motivation for ICT interaction.

1. Research questions

Within the purpose of this study we defined below stated research questions:

1. What is the familiarity with advanced technology by elderly people in different regions in Slovenia?
2. What kind of reasons elderly people state for not using advanced technology i.e. television, computer, Internet, mobile phone and ATM machines?
3. Who motivates elderly people to use advanced technology e.g. computer and mobile phone?
2. Materials and Methods

The research design is based quantitative research methodology with the purpose of collecting data from randomly selected elderly participants.

Participants

The study was performed among randomly selected elderly people from three Slovenian geographical regions namely Zasavje, Celje and Ljubljana region. Selection of the participants was held in a manner that undergraduate students invited elderly to take part in the study among random passersby. Within the study participated 100 elderly people aged 65 and more; the majority of the participants were aged between 65 and 75 years. In order to assure gender equality we included in the study the same number of men (50 participants) and women (50 participants). Additionally, all respondents were aware of prior to the survey, that the participation in the survey is anonymous and voluntary and that an individual can withdraw from the study at any time. Respondents were also informed that the data collected will be used exclusively for the research purpose.

Design and measures

Non-standardized research questionnaire was developed for the study. Questionnaire included 28 questions, of which 20 were close-ended, 5 were open-ended and 3 questions were a combination of close-open-ended. Questionnaire included basic demographic data such as age, gender, education and questions related to the use or nonuse of advanced technology e.g. television, computer, mobile phone and ATM machines, the frequency of advanced technology usage, questions relating to the computer possession, use of World Wide Web (Internet), methods of motivation for ICT use, etc. Questionnaire was developed in Slovene language and was before being administered validated by two elderly persons who were ICT literate and gave feedback according to which some questions were erased and some were amended so as to be clearer. All participants received the same questionnaire which they answered through organized individual interviews performed by undergraduate nursing students.

Procedure

The research study was performed in February 2011 and was at first implemented in Ljubljana region, then in Celje region and finally in Zasavje region by several undergraduate nursing students. Before administering research questionnaire to randomly selected elderly people, students personally introduced themselves to each elderly person and invited each individual to survey participation. Additionally, students presented to each participant the purpose and objectives of the research study. The research study was performed in a way that each elderly person had personal and confidential interview with student within which a student at the point of research execution simultaneously made notes of all elderly people’s answers.
Data analysis

For the statistical analyses we used IBM SPSS Statistics 19 software and conducted the basic descriptive statistical methods (frequency analyses, cross tables), and inferential statistical methods (Chi-square tests) in a manner to prepare appropriate interpretations on research questions. The results are presented in four separate sections namely: Background of respondents; Familiarity with advanced technology by elderly people in different regions in Slovenia; Reasons for not using advanced technology; and Motivation of elderly people to use computer and mobile phone.

3. Results

Background of respondents

In the research, 100 elderly people participated from three Slovenian regions. From Ljubljana regions originated 30 % of elderly people (30 elderly people), from Celje 30 % (30 elderly people) and from Zasavje 40 % of elderly people (40 elderly people). Elderly people were in majority aged between 65 and 75 years (52 %), 35 % of elderly were aged between 76 and 85 years and in minority 13 % were aged more than 85 years. Most of participants (43 %) passed high school or vocational school, 37 % of them passed primary school, a lesser number of participants passed college or university (13 %) and 7 % of elderly reported unfinished primary school.

Familiarity with advanced technology by elderly people in different regions in Slovenia

Within performed descriptive statistical analysis we found out that computer literacy of elderly people in Slovenia is still quite low, only 30 % of elderly people in Ljubljana region possess computer, 28 % in Zasavje region, and in Celje region only 27 % of elderly people. When asking elderly people about computer usage we found out that elderly in minority use computer; in Ljubljana region 43 % of elderly people use it, 28 % in Zasavje region and only 27 % in Celje region. Nevertheless that we would expect that in the most developed Ljubljana region the number of elderly people who possess or use computer would be higher compared to other cities and regions in Slovenia, we were not able to show statistical significant difference in possessing computer (p= 0.96) or using computer (p=0.28) by elderly people according to different regions in Slovenia. When asking elderly people about mostly used technological devices among which they could only choose between television, computer, mobile phone and ATM machine, the results showed that elderly people among all technological devices mostly use television (100 % in Zasavje region, 97 % in Ljubljana region and 83 % in Celje region). On this basis we were able to show tendency toward significant difference of the most frequently used technological devices according to different regions (p=0.06). Elderly people are in the majority very familiar with the concept “digital television” and all it represents; however the familiarity of the concept varies according to the regions which we were also able to prove with statistical analysis (Chi-square test) (p=0.05).
Similarly to computer also Internet is mostly used by elderly people in Ljubljana region 43%, 28% in Zasavje and 27% in Celje region; however we did not significantly prove the difference in Internet usage according to regions. Mobile phone is mostly used among elderly people who live in Zasavje region (85%), in too little less extent in Ljubljana 83% and Celje region (77%). ATM machines are in general used less frequently among elderly people, the results showed that in Ljubljana region only 50% in Zasavje 40%, and in Celje region 33% of elderly withdraw money from ATM machines; however we did not prove statistical difference according to regions (p=0.42). In terms of answering the first research question the present study revealed that computer use by elderly people is quite low, still the general familiarity with advanced technology in Slovenia is satisfactory. However there are some differences between regions in Slovenia regarding advanced technology use which also depends on regional development. In the Ljubljana region elderly people in the highest percentage possess computer, and consequently also use computer and Internet; however on the other hand elderly people in Zasavje region are most familiar with the concept of “digital television” which could result in the maximum TV viewing. In Zasavje region additionally elderly people make maximum use of mobile phones compared to Ljubljana and Celje region. All in all, in Celje region elderly people are apparently least advanced and familiar with modern technology compared to other regions in Slovenia, however the level of familiarity is still on the satisfactory level.

Reasons for not using advanced technology

Elderly people reported similar fears i.e. lack in knowledge, age, lack in interest etc. and reasons why they are not using advanced technology. Lack in ICT knowledge is still the most frequently mentioned reason for not using Internet (32%) or computer (28%). Next reason they mentioned is their age; meaning that they think that they are too old to learn new things and it seems that for the elderly people this particular reason is higher for not using computer (20%) compared to not using Internet (16%) (Table 1). Very important reasons also mentioned are distrust and high costs of computer equipment and monthly rate for Internet connection; however the percentage of elderly people recognizing those reasons for not using computer is higher compared to not using Internet. Furthermore, we were able to statistically prove the differences in stated reasons by elderly people for not using computer and not using Internet (p=0.00). Additionally, we statistically proved the differences in stated reasons for not using computer according to age of elderly people (p=0.02); however we were not able to prove that according to the level of education (p=0.10). Similarly, we proved statistical significant difference in stated reasons for not using Internet according to age of elderly people (p=0.02); but did not prove that according to the level of education (p=0.09). Elderly people mentioned as reason for not using mobile phones lack in knowledge how to use it (5%) and very interestingly, usage of landline telephones (14%). Additionally, elderly people mentioned as a reason for not using ATM machines, rather going to the bank by themselves (29%), lack in knowledge (15%) and fear and distrust in ATM machines (15%).

We proved statistical significant difference in stated reasons by elderly people for not using mobile phones according to the level of education of elderly people (p=0.00); however we did not show significant difference in stated reasons for not using mobile phones according to age of elderly people (p=0.67). Additionally, we were not able to
Table 1. Reasons for not to use computer, mobile phone, Internet and ATM machines

<table>
<thead>
<tr>
<th>Reasons not to use</th>
<th>Computer</th>
<th>Internet</th>
<th>Mobile phone</th>
<th>ATM machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack in knowledge</td>
<td>28 %</td>
<td>32 %</td>
<td>5 %</td>
<td>15 %</td>
</tr>
<tr>
<td>Age</td>
<td>20 %</td>
<td>16 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of interest</td>
<td>10 %</td>
<td>9 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial burden</td>
<td>10 %</td>
<td>6 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don’t know</td>
<td></td>
<td></td>
<td>5 %</td>
<td></td>
</tr>
<tr>
<td>Use of landline telephone</td>
<td></td>
<td></td>
<td>14 %</td>
<td>15 %</td>
</tr>
<tr>
<td>Distrust, fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The use of bank</td>
<td></td>
<td></td>
<td>81 %</td>
<td>41 %</td>
</tr>
<tr>
<td>Missing value</td>
<td>32 %</td>
<td>32 %</td>
<td>81 %</td>
<td>41 %</td>
</tr>
</tbody>
</table>

prove statistical significant difference in stated reasons for not using ATM machines according to the level of education (p=0.56), and age of elderly people (p=0.37). When studying differences in stated reasons for not using computer, mobile phone, Internet or ATM machines according to regions, we only proved statistical significant difference in stated reasons for not using mobile phone (p=0.01). From the results of the present study it is clear that elderly people mostly state as reasons for not using computer and Internet the lack of knowledge and the age. Interestingly, elderly people still in a big amount use landline telephones and this seems to be quite strange in today’s era of digital devices with which people could be reached anyplace and anytime. ATM machines still represent a “mystery” to elderly people; therefore they still perform almost all banking activities in their banks. Above presented results provided answer to the second research question.

Motivation of elderly people to use computer and mobile phone

The most important for elderly people’s motivation to use ICT is the society, various associations, individuals who surround elderly, which was shown also in the present study. Elderly people in all three regions in Slovenia were mostly self-motivated to use computer (34 %); however it seems that very important role in motivating elderly people for computer use also have various associations connected to elderly people like elderly homes, associations for retired people, etc. (34 %). Family members were also mentioned as important support and motivation for elderly to use computers (13 %). Surprisingly only 9 % of elderly people were motivated through their friends; however elderly people are obviously still very working active and employed, since the fact that 9 % of elderly people were motivated at their jobs to use computers. We were not able to statistically prove elderly people’s report on who or what motivated them to use computer according to different regions in Slovenia (p=0.48). Mobile phones are also popular among elderly people and they were mostly motivated to use it by their family (57 %), and to a little less extent elderly were self-motivated to use mobile phones (37 %). Some elderly were also motivated to use mobile phones through various associations dealing with elderly (4 %) and friends (2 %). Within this study we were able to show the statistical significant tendency toward the fact who motivated elderly to use mobile phones according to different regions in Slovenia (p=0.06). From the above results it is clear that elderly people are mostly motivated to use advanced technologies by themselves, however they get support and are motivated also through various associations where elderly people live, work or spend their leisure time. Elderly people’s families are very supporting when it comes to using mobile phones which is quite expected, since in this way they are connected to
older persons in their families at any time anywhere. Above presented results represent
the answer to the third research question.

4. Discussion

The purpose of this study was to find out if there are regional differences in familiarity
with advanced technology in Slovenia, what are the elderly people’s reasons for not
using advanced technology, and finally how elderly people are being motivated to use
advanced technology e.g. computer and mobile phone in their daily life.

The present study has some limitations; first would be the use of the non-
standardized measurement tool. Due to the fact that many studies have been performed
on using advanced technology it would be perhaps better to use a measurement tool
which was previously used to be able to compare results. Nevertheless, the questions
were quite similar so the correlation with other similar studies is still possible.
Furthermore, another limitation could be recognized in designing close-ended question
relating to the age of participants, meaning that elderly people had three age group
options, within which they had to identify their age; however the problem occurred
during statistical analyses, since we could not calculate mean age of participants and
standard deviation. Another limitation worth mentioning is decision concerning gender
equality and the selection of exactly the same number of men and women. The
selection of the research environment, namely only three of twelve Slovenian regions is
also one limitation of the present study. Another limitation could arise during the data
collection procedure, due to the fact that students made notes of all elderly people’s
answers; therefore some answers could be misunderstood, lost or incorrectly written.

Familiarity with advanced technology by elderly people in different regions in Slovenia

The present study showed that in all three Slovenian regions elderly people reported the
most frequent use of television; which was shown also in the study conducted by
Grajczyk and Zöllner [10]. Interest of the elderly people for this particular medium can
be explained by its potential for replacing loss of social contacts on one hand, and on
the other, television help elderly people maintain the feeling of participation in society.
Additionally, with television elderly people cope with alienation and loneliness [11].
However, the study performed by Rahtz, Sirgy, and Meadow showed negative
correlation between TV viewership and life satisfaction among the elderly people;
meaning that more elderly people watch television less they are satisfied with their life
[12]. As regards the use of the mobile phone, the results also showed that elderly
people in Slovenia in majority use it which was expected since mobile phones can have
great benefits for the elderly users in supporting their daily life [13]. Among mentioned
advanced technology (television, mobile phone, computer, Internet, ATM machines)
elderly people least frequently use ATM machines; however they are most popular in
Ljubljana region. The reasons are maybe in the fact that Ljubljana is a large city with
relatively large number of people who all need to perform banking activities. Elderly
people still rather go to the bank to withdraw the money, but on the other hand some
ever people still recognize that this activity performed at the ATM machines saves a
lot of time. Socializing may be another reason to go to bank instead of using ATM.
Reasons for not using advanced technology

More or less elderly people reported as reasons for not using computer or Internet lack in ICT knowledge and age of participants. The lack in knowledge for not using computers was also reported by elderly people who participated in the study performed by Barbosa Neves and Amaro [14]; however they also stated that they do not need a computer and lack of access to computer. It is proven that age very often correlates with intention and use of technology, for example Carlsson, Hyvönen, Repo, and Walden found out that age is the only predictor whether elderly would use technology [15]. On the other hand Mallenius, Rossi, and Tuunainen claim the opposite that in age group between 65 and 95 years, age does not necessarily has such a big influence compared to younger people [16]. In Slovenia elderly people as reasons for not using mobile phone reported the use of landline telephone which is enough for them and the same reason was reported in the study conducted by Barbosa Neves and Amaro [14]. Elderly people in Slovenia still perform almost all financial activities personally at the bank, on the contrary in Finland elderly people often use advanced technology to perform e-banking activities, since the fact that it is much cheaper and quicker as going to the bank in person [17]. We assume that older people would rate lack of knowledge, interest and their age as the most important reasons for not using computer and Internet, and a little younger older people a financial burden of buying ICT acquipment and Internet connection. Additionally, there are differences in reporting reasons for not using mobile phones according to regions and the difference arises due to the fact that only in Celje elderly people reported lack of knowledge as a reason not to use mobile phones. This imply that in Celje elderly people are more comfortable to use landline telephone and do not so much rely on modern mobile devices.

Motivation of elderly people to use computer and mobile phone

The proper motivation of elderly people to use advanced technology is a key for the successful adaptation to the ICT and advanced technology use. The results of this study showed that family, friends and associations have a major role in elderly people’s advanced technology adaptation; however very surprisingly elderly people also are highly self-motivated to gain knowledge and skills about technology [14]. Social contacts with family and friends are usually a motivation for elderly person to get a computer, to learn ICT skills, to use Internet, online forms of communication; therefore it is obvious that family members and friends can positively affect elderly people’s motivation for ICT interaction. Within various associations elderly people work, interact and get inspirations from other peers.

5. Conclusion

Despite many organized promotional activities to motivate elderly people to use advanced technology such as computer and mobile phone to make their life easier, the elderly people’s utilization of it in three Slovenian regions is still very low. Due to the fact that one of the main reason not to use advanced technology is a lack of knowledge and skills we should in future organize more demonstrational activities such as workshops where elderly people could be introduced to the advanced technologies in
general and opportunities offered by advanced technologies in everyday life, especially from the standpoint of saving time and money and increasing their security. Additionally, within this kind of events we could collect valuable information regarding elderly people’s wishes and needs to be able to effectively support elderly people in the ICT adaptation process. It is especially important to perform more focused research on elderly people’s use of technology, reasons for use or non-use, wishes and needs to be able to develop appropriate actions and initiatives which will increase e-literacy of elderly people in all Slovenian regions irrespective of the level of development of each region and thus increase the e-literacy level to become closer to the European average.

Acknowledgments

The first author would like to thank registered nurse Mrs. Maja Dijanič, BSc who performed research study within diploma thesis and gave her permission to analyze and publish gathered data. Additionally, the first author is thankful to elderly people in all three regions in Slovenia who participated in the study.

References


