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# How is the Elderly's Capability to Use Smartphones in Banda Aceh

Nurhasanah Nurhasanah[1], Hanifa Asmawita[2], Khairani Khairani[1], Nurul Hadi[1], Irfanita Nurhidayah[3], Dara Febriana[1], Ardia Putra[4]*

*[1]Department of Geriatric Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia; [2]Bachelor Nurse, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia; [3]Department of Emergency Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia; [4]Department of Fundamental and Management Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia*

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***Correspondence:** Ardia Putra, Department Fundamental and Management of Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia. Tel.: +62 8126976153. E-mail: ardia@unsyiah.ac.id
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**Abstract**

**BACKGROUND:** Smartphone is one form of technology that is increasing that provides many benefits for the elderly such as the many applications adapted to improve the quality of life of the elderly; one of them is the existence of health applications.

**AIM:** The purpose of this study was to determine how the ability to use smartphones in the elderly in Banda Aceh, which includes the ability to use the basics of the software, communication, data and file storage, internet, calendar, entertainment, privacy, and security, and software troubleshooting and management.

**MATERIALS AND METHODS:** This study used a descriptive exploratory with a cross-sectional study design. The sampling technique is non-probability sampling using the snowball sampling method with as many as 400 older people. The research data were analyzed using descriptive statistics, namely, the distribution of frequencies and percentages.

**RESULTS:** The results of the research in the capable component contained the primary use of mobile devices (99.5%), entertainment (95.3%), and the internet (86.3%). While the part that respondent is less capable, there are privacy and security (94.5%), data and file storage (81.7%), communication (79.5%), calendar (59.7%), as well as troubleshooting and device management soft (50.5%).

**CONCLUSION:** From the study finding, it is expected that nursing services can improve the ability of the elderly in fulfilling the IADL. One of them is utilizing existing smartphone applications and providing nursing interventions for the elderly using smartphones.

## Introduction

In the digital era like today, technological progress cannot be avoided. One of the fastest-growing forms of technology is smartphones. In the elderly themselves, several sophisticated applications have been made to improve the quality of life of the elderly, such as health applications. These applications help the elderly perform daily activities, to applications that function as a means of entertainment [1]. There are five kinds of activities carried out by the elderly daily, such as eating, bathing, dressing, mobility, and toileting [2]. A smartphone application system is also formed to monitor the elderly's daily activities, such as ironing, brushing teeth, drying hair, and talking. This application will make it easier for the elderly or their families to ensure that the elderly's activity daily living (ADL) is met [3].

In Gordon and Hornbrook [4], they found several smartphone applications that can detect the risk of falling in the elderly when fulfilling their ADL, and these applications work very well to remind the elderly to stay balanced when doing their daily activities. Moreover, the applications on smartphones can also be used by 78% of older people with cardiovascular disease to monitor their heart rhythm, so they do not worry when doing daily activities or when left alone at home by their families [5]

Based on a survey on the use of information and communication technology, 66.3% of individuals own a smartphone, stating that more than half of Indonesians already have a smartphone. Moreover, based on the age included in the elderly category, namely, 50–65 years, the number of the elderly who use smartphones is 50.79%, and those who do not use smartphones are 49.21% [6].

We are currently entering a period of population aging, where life expectancy is increasing while elderly population is increasing. In 2019, the global population aged 65 and over was 703 million. By 2050, older people are expected to double to 1.5 billion. Globally, the population aged 65 years and over increased from 6% in 1990 to 9% in 2019. Elder people proportion is projected to rise to 16% in 2050 so that one in six people in the world will enter the age of 65 or more [7].

According to Kementerian Kesehatan Republik Indonesia [8], Indonesia's elderly population itself has increased from 18 million (7.56%) in 2010 to 25.9 million (9.7%) in 2019 and is expected to continue to grow. In 2035, it will reach 48.2 million people (15.77%).

Based on the record results on the health profile of Banda Aceh in 2019, the number of elderly residents in the Banda Aceh area in 2019 amounted to 17.104 people, and those who received standardized elderly health screening were 10.392 people with a percentage of 60.76% [9]. The survey results described previously show that more than a portion of the elderly population in Indonesia already uses smartphones. With the rapid development of the era, the elderly can be a little behind in operating their smartphones [6].

The main difficulties in adapting smartphones for the elderly are the limited or lack of socialization, the complexity of the mobile user interface or navigation menu, the amount of organized information on the screen, the number of functions, languages, etc. As a result, the elderly are more interested in cell phones than faced with devices too tricky for them to use, such as smartphones [10].

The use of smartphones is increasing in the current technological era, making smartphones commonly found in various walks of life. Applications contained in smartphones can help the elderly carry out their daily activities. However, due to the lack of ability of the elderly to access various information through digital technology, they only use smartphones to a limited extent without knowing the many benefits that can help their daily lives [11]. This is evidenced supported by the Internet Service Providers Association Research, which states that only 2% of the elderly understand the development of the internet [12]. Based on the above phenomenon, the researchers are interested in discovering the elderly's capability to use smartphones in Banda Aceh?

## Materials and Methods

This study uses an exploratory, descriptive study design with a cross-sectional research design. The study population amounted to 17,104 older people aged 60 years and over who live in Banda Aceh city [9]. The number of samples as many as 434 people was calculated using the Slovin formula [13]. Overall, the number of samples is 400 respondents (response rate 92.2%) obtained using the snowball sampling technique method.

Data collection using a web-based questionnaire with a Google Forms. The questionnaire used in this study, namely, the mobile device proficiency questionnaire (MDPQ-16). This questionnaire consists of 16 questions, a simplified form of the MDPQ-46. Each question item has five levels of points that will be calculated based on the answers chosen by the respondents. This instrument can be used as a reference for measuring the skill level of the elderly, as evidenced by the results of the validity and reliability tests conducted by Roque and Boot (2016) [14].

Data collection was performed after obtaining an ethics pass letter from the Research Ethics Committee of the Faculty of Nursing, Syiah Kuala University, with the ethics number 1612101010035. Data analysis consisted of univariate analysis. Univariate analysis was used to see the frequency distribution and percentage of the variables studied [15].

## Results

Based on the research that has been done, the following results were obtained:

Based on the data from Table 1, it is concluded that most respondents in this study were aged 60–69 years, namely, 386 people (96.5%). Most of the respondents were female, as many as 264 people (66%). Most of the respondents' last education was elementary-high school graduates, totaling 288 people (72%). Finally, the average respondent's cell phone usage was > 5 years, namely, 279 people (69.8%).

**Table 1: Demographic data of respondents (n = 400)**

| Category | F | % |
|---|---|---|
| Age | | |
| 60–69 years | 386 | 96.5 |
| >70 years | 14 | 3.5 |
| Gender | | |
| Male | 136 | 34 |
| Female | 264 | 66 |
| Last education | | |
| SD-SMA | 288 | 72 |
| Diploma | 32 | 8 |
| Bachelor | 64 | 16 |
| Magister | 16 | 4 |
| Smartphone's usage period | | |
| <5 years | 121 | 30.2 |
| >5 years | 279 | 69.8% |

## Discussion

Based on the results of the study in Table 2, it is concluded that the use of the basics of software on smartphones such as selecting menus using the touch screen and typing using the keyboard can be said to be in the capable category as many as 398 people (99.5%). Characteristics of smartphone applications are symbols and icons that are easy to recognize and use, easy access to menus and submenus, and the distance between contents [16].

**Table 2: Basics of using a smartphone**

| Sub-component | F | % |
|---|---|---|
| Software basics | | |
| Capable | 398 | 99.5 |
| Less capable | 2 | 0.5 |
| Communication | | |
| Capable | 82 | 20.5 |
| Less capable | 318 | 79.5 |
| Data storage | | |
| Capable | 73 | 18.3 |
| Less capable | 327 | 81.7 |
| Internet usage | | |
| Capable | 345 | 86.3 |
| Less capable | 55 | 13.7 |
| Calendar usage | | |
| Capable | 161 | 40.3 |
| Less capable | 239 | 59.7 |
| Entertainment | | |
| Capable | 381 | 95.3 |
| Less capable | 19 | 4.7 |
| Privacy and security | | |
| Capable | 22 | 5.5 |
| Less capable | 378 | 94.5 |
| Software troubleshooting and management | | |
| Capable | 198 | 49.5 |
| Less capable | 202 | 50.5 |

The convenience of using a touch screen is used by the elderly in Nigeria to type messages and send them to their children through SMS or text messages because many of their children do not live in the same city where the elderly live [17]. However, this is different from the research of Sakdulyatham *et al*. [18], which admits that it is challenging not to make mistakes when typing something or when scrolling the screen to find a menu list. Hence, they spend an average of 1 min 19 s to finish typing a short text or to select a menu.

Kim *et al.* [19] stated that the average elderly could not use communication devices, as evidenced by the infrequent or even non-existent use of email to send messages. However, in their research, Gordon and Hornbrook [4] stated that as many as 70% of the elderly could operate their communication devices, especially to get health information and provide questions to doctors through email applications. Lack of knowledge about smartphones/computers causes the elderly not to understand how to use them. As well as the influence of advancing age, the elderly's sense of vision is disturbed, and it is too difficult to use their smartphones/computers [20].

Smartphones have advanced features that everyone can use to facilitate and help them carry out their daily activities, especially for the elderly who need assistance in several aspects of their lives. Stockwell *et al.* [21] stated that internet devices could be used by the elderly to conduct various kinds of searches around information, whether it is about health, the latest news, hobbies, etc. The internet can also access social networks that make the elderly forget their loneliness [22].

Furthermore, the calendar devices are less capable of being used in some older people [23]. Petrovčič *et al.* [24], in their research, found that more than half of their respondents were able to use calendar devices as reminders to help them remember the day and date, record specific events, and remind them to the following schedule.

The positive effect of using calendars, such as Google Calendar, makes an older person remember a specific schedule and helps remind the elderly to do specific tasks when the time comes [25]. Hence, it can be linked to the ability of older people to accept the presence of smartphones and technology in their lives [25]. The most common uses are birthday reminders, private social events, shopping lists, doctor's appointments, public events, contact information, travel, and talks [26]

Generally, older people it is always associated with loneliness. The entertainment devices contained in smartphones can be used by the elderly to relieve their loneliness, such as listening to music and downloading several applications from the App Store/Google Play Store. Stelling-Konczak *et al*. [27] mentioned that almost all elderly can use entertainment devices such as listening to music, exercising, on a trip, and when they are lonely.

Furthermore, on privacy and security devices, the average elderly in this study were less able to use them (94.5%). The elderly admitted that it was too difficult to remember the steps to do it, and also, they said that they were too lazy, so it took a long time to use the device [28]. The elderly do not regulate the privacy of their smartphones which are stated that they are less able to understand how to use it and have low awareness of the importance of managing privacy and security on their smartphones [29]. Khawaji [30] mentions that deleting or updating an application is often difficult for the elderly who use smartphones because the steps required sometimes confuse the elderly. Hence, they decide to use them [31] rarely.

## Conclusions

Based on a study of 400 older people who use smartphones in Banda Aceh city, it can be concluded that the elderly in Banda Aceh city better understand the use of two main sub-components, namely, software basics (99.5%) and internet usage (86.3%). Meanwhile, the three sub-components that are less able to be used by the elderly include privacy and security (94.5%), data storage (81.7%), and communication (79.5%).

Hopefully, this research can provide new ideas for nursing services, especially in delivering pleasant interventions to the elderly through applications that can be used on smartphone devices. This research can also be used as a basis for creating health-based applications that can be used by the elderly to make it easier for them to get health information. It also helps them carry out their daily activities to avoid unwanted risks.

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