Development of Screening for Early Detection of Depression, Anxiety and Stress in Adolescents Based on Android Services

Zulian Effendi
Mental Health Nursing Department
Sriwijaya University
Palembang, Indonesia
effendizulian7@gmail.com

Sri Maryatun
Mental Health Nursing Department
Sriwijaya University
Palembang, Indonesia
tunce79@yahoo.com

Herliawati
Mental Health Nursing Department
Sriwijaya University
Palembang, Indonesia
herliawati74@gmail.com

Abstract— The adolescent is a transition period from childhood to adulthood. Adolescents are often associated with problems because of the changes that occur during adolescence in the form of biological, cognitive, and social-emotional changes. Changes that occur during adolescence, making adolescents vulnerable to the occurrence of psychosocial problems. Many adolescents experience psychosocial problems such as depression, anxiety, stress, sleep disturbance, traumatic and sadness for a long time but do not know what they should do so many teens vent towards negative behaviors such as drug abuse, violence, crime, dropping out of school. This is due to the lack of information they can get regarding mental health issues other than that these conditions occur because the making of a mental health screening process cannot be in line with the current state of society. The purpose of this study is to make an early detection application of depression, anxiety, and stress based on android services. This application is intended for adolescents to provide information about mental health, especially depression, anxiety, and stress. This application contains features about the early detection of mental health problems and mental health information. In adolescents who experience mental health problems can immediately get the right treatment and prevent the emergence of more severe mental problems so that this service can support increased mental health movement..

Keywords: screening, adolescent, depression, anxiety, stress, android

I. INTRODUCTION

The adolescent is a period of development during which individuals experience changes from childhood to adulthood, usually between the ages of 13 to 20 years [1]. Population demographics data in the world shows that the number of adolescent populations is the largest population of the world's population. WHO states that 18% of the world's population are teenagers or as many as 1.2 billion people [2]. Based on the results of the 2010 population census, the number of adolescents in Indonesia is around 67 million or 29% of the total population [3]. In the South Sumatra region in 2014, the youth population numbered 27.52% or 1,522,196 inhabitants [4]. A large population of adolescents will have a bad impact if the adolescents exhibit negative behavior and are involved in the problem [5].

Adolescents are often associated with problems because of the changes that occur during adolescence in the form of biological, cognitive, and social-emotional changes. Social-emotional change is characterized by starting to need more friends and associates, starting to like the opposite sex, rebellious and resisting behavior, expressing freedom and expressing feeling like an individual, not just like a family member [6]. Changes that occur during adolescence, making adolescents full of emotional turmoil that is not balanced. This triggers the occurrence of deviant behavior of adolescents Deviations in adolescence are influenced by high curiosity, the negative influence of the media and playing environment, family conditions that are less conducive [7]. This situation also often triggers conflict between adolescents and themselves (internal conflicts), if not resolved properly it will have a negative impact on the development of adolescents in the future, especially on the maturation of their character and often triggers emotional mental disorders or disorders mental health in the form of depressive disorders, anxiety, and stress.

According to WHO data (World Health Organization) in 2016, there were around 35 million people affected by depression. WHO states that depression will become the disease with the second largest global burden in the world after ischemic heart disease in 2020. The results of a survey in 14 countries in 1990 showed that depression is a health problem with the 4th largest position in the world that causes a social burden. The prevalence of depression in Indonesia is quite high, which is around 17-27%. This can be seen from the increasing number of suicides in Indonesia, up to 50,000 suicides in 2014. Very far compared to 5000 suicides in 2010 [8].

Data from the CDC in 2007-2010 states that the prevalence of depression at the age of 12-17 years is 6.3%. This age includes the early and middle adolescent age group and is the age of secondary school education. Based on data from Health National Research in 2013 showed the prevalence of emotional mental disorders as indicated by symptoms of depression, anxiety, and stress for ages 15 years and overreaching around 14 million people or 6% of Indonesia's population [8]. People with anxiety disorders 10-15% also experience severe depression. Anxiety disorders generally

occur at a young adult age, around 25 years, but can occur at any age, including children and adolescents.

Increasing adolescent mental health problems, the need for mental health services is also increasing. The reach of mental health services must be able to reach distant communities and not just those who live in big cities. This is an effort to equalize health services. But these efforts have not yet brought maximum results, because the number of mental health workers is still very limited, not many people themselves care about their mental health so that it is not detected and not properly addressed.

Many adolescents experience mental health problems such as anxiety, depression, stress, sleep disturbance, traumatic and sad prolonged but do not know what they should do so many teens vent towards negative behaviors such as drug abuse, violence, crime, dropping out of school. This is due to the lack of information they can get regarding mental health issues other than that these conditions occur because the making of the screening process cannot be in line with the current state of society. The current state of society that is most known is the use of smartphones [9].

The number of adolescent smartphone users who access the internet every day makes researchers interested in creating an Android-based early detection service application that is easily available on Playstore. This application contains features about early detection of mental health problems, intervention plans, and evaluations. In adolescents who experience mental health problems can immediately get the right treatment and prevent the emergence of more severe mental problems so that this service can support increased mental health movement.

II. Methods

The research method used in this research is the Research and Development method. Research and Development Method is a research method used to produce certain products, and test the effectiveness of these products. The development method adapted from the multimedia development model according to Luther in Binanto which was carried out in 6 stages namely Concept, Design, Material Collection, Assembly, Testing, and Distribution [10].

The initial stage is the identification of the problem, after which the problem is solved by making a concept and looking for references in the literature review. The next step will be obtained hypothesis, namely, the concept of designing screening for early detection of depression, anxiety and stress in adolescents based on android services. Then the material is made to make an early detection screening and validate it. The next step is making an application for screening software for early detection of depression, anxiety, and stress by using android software development. After the application software is finished, the next step is to test the software in content and instruments. Then the final stage is distributing through the Playstore.

III. Result

This research resulted in early detection of depression, anxiety and stress screening application called SDASI (screening for depression, anxiety, stress). Android-based SDASI application development is done by providing several features. Available features include a login page; an early detection page consisting of 7 items each statement on depression, anxiety, stress; and health information pages about depression, anxiety and stress. The early detection page is equipped with an answer filling guide.

The SDASI application display on the smartphone consists of the start page, on this page the SDASI application logo will appear for approximately 3 seconds. After the logo disappears, the application user will be directed to the application login page (figure 1.a). The login page is a security system used in applications. Only users who have a username and password can log in to the application. After the user fills in the correct username and password, the user will be directed to the main page of the application. The application's main page consists of a depression check, an anxiety check, a stress check and health information (figure 1.b). Also on the main page menu, the application is equipped with a navigation drawer which is a panel that displays the main navigation options of the application from the left edge of the screen.
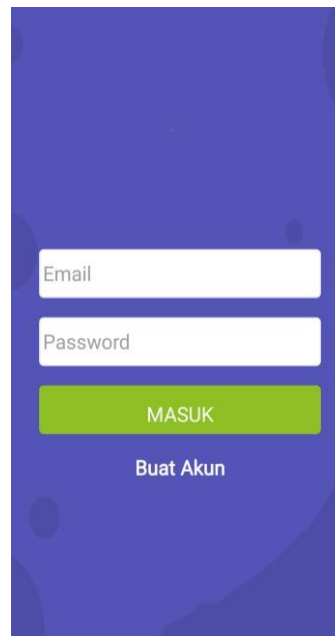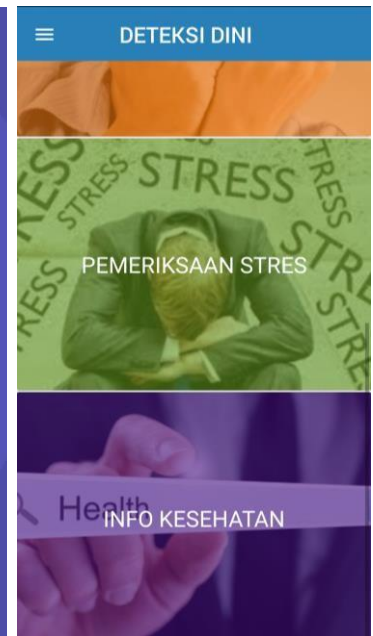

figure 1.a   figure 1.b

feature on examination, anxiety examination and a stress examination, each of which consists of 7 question items that describe the client's condition during the past week and there are no right or wrong answers to this examination. Each examination be it an examination of depression, anxiety and stress consists of 7 question items whose answer choices use a Likert scale consisting of never, sometimes, often and almost always (figure

2.a). After the user completes all question items, an examination result will appear which is classified as normal, mild, moderate, severe and very heavy on each examination criteria conducted. After the results of the examination appear, application users will be directed to a health information page be it depression, anxiety and stress to get knowledge in the form of how to reduce depression, anxiety, and perceived stress (figure 2.b).

figure 2.a   figure 2.b

The trial was conducted on adolescents in schools involving 60 respondents. Adolescents were asked to fill out a questionnaire containing responses to the media applications made. The results of the questionnaire given to adolescents are presented in Table 1.

TABLE I. . RESULTS OF TRIAL QUESTIONNAIRE FOR ADOLESCENTS

No	Indicator	Average Percentage	information
1.	Media Display	87 %	Strongly Agree
2.	Operation of Media	76 %	**Agree**
3.	Presentation of Material	82 %	Strongly Agree
4.	Use of Language	80 %	Strongly Agree
	Overall Average	81 %	**Very Good**

IV. DISCUSSION

The development of information technology in the field of nursing has been developing for a long time. Various smartphone applications in the world of nursing have been developed. Even it has been going on since mobile technology still uses a PDA (Personal Digital Assistant) system. In 2004 research conducted by Choi

et. al. which is developing a prototype MobileNurse application that uses a PDA system aimed at increasing the mobility of clinical information systems, access to patient information, and increasing nurse work productivity. From this study revealed several benefits obtained from the use of applications, including applications can lead to double work, the quality of care improved, information related to patients will be more quickly known to the whole team [11]. The development of nursing information technology continues to develop until now. Nurses began to realize that being involved in the design and implementation of nursing information systems was very important. Nursing information systems are not only for data storage but starting from the process of assessment to evaluation can be utilized [12].

Another study conducted by Liu et al., (2016) revealed that the use of smartphones is effective for various aspects of the world of health, in providing nursing care, providing health education, evaluating patient nursing care, and conducting professional communication between health teams [13]. Better results will be obtained in the use of smartphone applications in the world of health and nursing. Nursing information technology concerning the use of smartphone applications will continue to experience development in the future. Nurses as application users should take a role in the design and development of applications. Nurses must continue to improve their abilities and knowledge in using applications, through seminars and training activities.

SDASI application development on smartphones which is done by presenting several features shows that the SDASI application can detect early disorders of depression, anxiety, and stress. Besides this application is able to increase the knowledge of adolescents about psychiatric problems experienced so that with the source of information that can be obtained by adolescents can easily minimize the problems faced by adolescents. This is consistent with the results of research conducted by Kang et al., on developing smartphone-based injury prevention applications (S-IPA) for teachers working in childcare centers, resulting in the fact that smartphone applications have various advantages. With the use of a smartphone application, an information delivery system will be more effective [14]. .

V. CONCLUSION

Based on the results of the study it can be concluded that the development of an early detection application for

depression, anxiety, and stress, based android services is very feasible to use. The development of android based early detection of depression, anxiety, and stress screening is expected to provide benefits, especially for adolescents in overcoming mental health problems and preventing the emergence of more severe mental health problems so that this application can support increased mental health movement.

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