

# DESIGN ANDROID-BASED APPLICATION OF “PERMEN” FOR MENARCHE PREPARATION FOR TEENAGE GIRLS

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## Abstract

*According to Riskesdas data, menarche among adolescents aged 10–19 years typically occurs at age 12 (42.8%), age 15 (96.2%), and age 18 (99.6%). Many adolescents experience anxiety during their first menstruation due to a lack of knowledge, leaving them psychologically, mentally, and emotionally unprepared for the bodily changes. In today’s digital era, there is a growing need for accessible educational tools that provide accurate information about menstruation. To address this, an application called “Permen” (short for \*Persiapan Menarche\*) was developed to help adolescent girls prepare for their first menstruation anytime and anywhere. The aim of this study was to design a mobile-based menarche preparation application using the System Development Life Cycle (SDLC) method. The SDLC model applied was the waterfall model, which follows a structured, step-by-step approach in software development. The research successfully resulted in the creation of the “Permen” application, which has undergone both black box testing and expert validation. The application provides comprehensive and age-appropriate information about menarche, helping reduce anxiety and increase awareness among adolescent girls. In conclusion, the “Permen” application serves as a practical educational tool to support young girls during the transition of puberty by improving their readiness and understanding of menstruation.*

**Keywords:** Adolescent Girls, Application, Menarche Preparation.

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## 1. Introduction

A period which is a very important time for humans is the teenage period. The teenage period can be said to be a transition from childhood to adulthood which of course there are many changes from several things such as biological, psychological and also socio-cultural aspects [1].

During adolescence, there is also an adjustment to the body physically due to changes in the sex hormones that have begun to function, such as estrogen and

progesterone hormones. Girls will face their teenage years two years earlier than boys, namely the age of 12 for girls and 14 for boys [2].

In early adolescence before entering the reproductive period, here young women really need extra attention. An important aspect used to determine the early period of adolescence of a young woman is the arrival of Menarche (first menstruation) and usually occurs between the ages of 10-16 years [3].

Menarche (first menstruation) comes to teenage girls at a minimum age of 10 years. However, in today's era, many teenage girls get menarche at an age of less than 10 years. This is due to various factors, one of which is health status which will affect the welfare of teenage girls in the next stage of life [4]. Based on research results, around 15 out of 100,000 teenage girls whose first menstruation occurs early (less than 10 years old) are increasing. Based on Liputan 6 news, it was also said that the number of teenage girls who experience their menarche menstruation less than 10 years old is increasing [5].

There will be many changes in young women as a sign of their youth, but if there is no understanding and knowledge about the first menstruation (Menarche) then there will be anxiety and worry in the young women. Menarche in young women can cause positive and negative acceptance<sup>[6]</sup>. Negative acceptance When menarche (first menstruation) comes, feelings of shock, disbelief, confusion, anxiety and restlessness arise, so that feelings of trauma arise and one cannot accept the changes that occur in one's body [2]. At this time, teenagers need special attention because at this time it is a time for teenagers to learn about various lives, and to experience themselves. Demographic data shows that teenagers are a large population of the world's population [7].

Based on the results of the study, it was found that adolescent girls will experience different reactions when their first menstruation comes, such as feelings of anxiety about what has happened to them, confusion about what to do, shame, and thinking about how to become an adult woman. These feelings always come and make an adolescent girl who has had her first menstruation (menarche) uncomfortable. In addition, the complaints that arise are like pain in the lower abdomen. The nature and pain of this pain vary for each teenager, some are mild and some are severe. This condition is called dysmenorrhea, which is a condition of pain, either mild or severe, so

that it can interfere with daily activities or activities [8].

Menarche (first menstruation) in adolescent girls is a natural thing experienced by women because it is a physiological process of the female body and does not need to be worried about. However, this will be something that is disturbing if the understanding of adolescents about this first menstruation is lacking and also the provision of knowledge from parents is lacking. The parents' understanding is wrong if they say that this menstruation is a taboo to discuss and assume that over time the child will know everything automatically. It is very important for all of us to pay attention before adolescent girls face their first menstruation, they need to be equipped with an understanding and knowledge about the first menstruation that will happen to them and there will be major changes in them both physically and psychologically [2].

At the beginning of adolescence, apart from physical changes, there will also be psychological changes, including unstable emotions and sensitivity, which will influence young women in facing and solving problems that come to them, especially when they experience menstruation for the first time [9]. Anxiety and confusion of adolescent girls during menstruation occurs because they do not yet have knowledge about the first menstruation (menarche). That is why everything that includes psychology, mentality and emotions of adolescents will arise so that they feel unprepared to accept the changes that occur in their bodies. This means that early knowledge of menstruation is very important for girls who will enter adolescence to face puberty. In addition, hormonal changes also occur when menstruation begins. Hormones are one of the things that play an important role in women's reproductive health. Fluctuations in hormone levels, especially estrogen and progesterone, can affect mood, sexual desire, ovulation and fertility [10]. Psychology in adolescence can affect the emotions of adolescents which can cause

stress. Stress in adolescent girls can disrupt the menstrual cycle [9].

Menstruation is an indicator of women's health, so young women need to understand menstrual patterns and factors that cause menstrual disorders or changes [11]. It is also important for teenagers to know about menstrual disorders, because menstrual disorders are common in teenage girls. Disorders that occur include delayed menstruation, irregular menstrual cycles, pain in the body area, and abnormal bleeding during menstruation [12]. Menstrual disorders are common in adolescent girls. Disorders that occur include delayed menstruation, irregular menstrual cycles, pain in the body area, and abnormal bleeding during menstruation.

The formulation of the problem in this study is: How to create a menarche preparation application software and how to design it according to the needs of adolescent girls in facing their first menstruation.

The objectives of this study include: Creating a menarche preparation application software that can be installed by an Android cellphone and can be accessed offline with an attractively designed display; increasing the knowledge of adolescent girls about preparing for their first menstruation; and providing convenience for adolescents to be able to access knowledge about menstruation anywhere and anytime.

This study presents novelty through a mobile-based menarche preparation application that is educational, interactive, and adaptive to local culture. This application is expected to be an innovative solution in improving adolescent reproductive health literacy, especially related to readiness for menarche.

## 2. Methods

This type of research is a design research, namely designing an android-based menarche preparation application for adolescent girls in preparation for their first menstruation. The research will be conducted at the Muhammadiyah

University of Tasikmalaya, namely the D3 Midwifery study program in collaboration with the Information Technology (IT) team. The tools used in developing this application are: Eclipse Indigo software, Microsoft Visual Studio 2010, and MySQL and XAMPP. Hardware: Laptop with Intel Core i3 Processor specifications, 2GB RAM, and 1TB Hard disk. Data collection in this study is from searching and reviewing literature based on the literature needed to deepen the material on concepts and theories related to android applications. Documentation is also carried out which aims to obtain direct data during the research process, in the form of relevant references, activity reports, photographs, and data relevant to the research.

The method used in creating the design of this Android-based mobile application or what is known as the menarche preparation "Permen" application is the System Development Life Cycle (SDLC) to ensure software quality, simplify implementation control and ensure that the software can meet user needs [13]. The SDLC model used in this study is the waterfall model. The waterfall model provides a sequential or ordered software lifecycle approach starting from system requirements analysis, design, testing, implementation, and maintenance [14].

## 3. Results and Discussion

The design of the "Permen" application has gone through black box and expert testing. The appearance of the "Permen" application is as follows:



Figure 1. Application Front View



Figure 2. Permen Application Login View



Figure 3. Application Menu

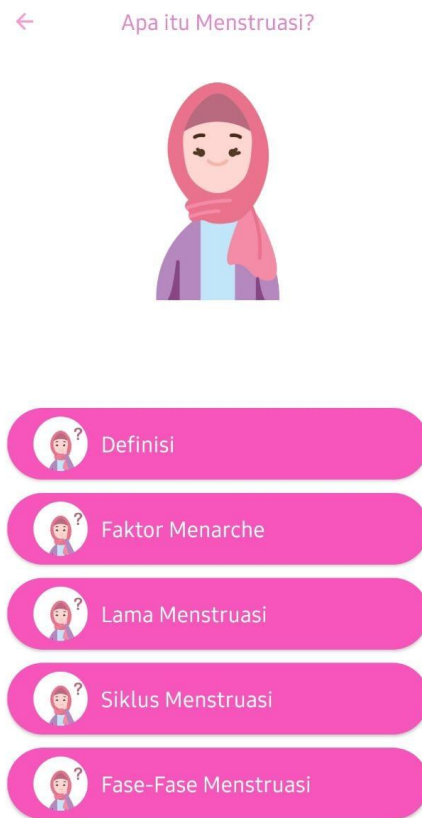


Figure 4. Application Submenu

This study has successfully designed a menarche preparation application (first menstruation) for adolescent girls named "Permen". The results of this study are in accordance with the theory according to WHO which states that adolescents are individuals in a transition phase from childhood to adolescence, which is marked by changes both physically and psychologically towards the maturity of their reproductive organs. An adolescent will go through many things in their growth and development stages. The things that will happen are the emergence of primary and secondary genitalia [15]. One of the primary signs that occurs in adolescent girls is the occurrence of the first menstruation /menarche. Menstruation at the beginning of puberty occurs irregularly for its cycle and pattern. This puberty period usually begins in our lives at the age of eight to ten years and ends more or less at the age of 15 to 16 years [16].

Menarche (first menstruation) is an important thing and occurs in teenage girls. Menarche itself is a process of regular blood discharge from the uterus as a sign that the reproductive organs are mature enough to reproduce [16]. In rural areas, menarche is a sign of maturity for a girl and she must be able to perform other roles as a woman. Menarche itself is the culmination of several changes that occur in a teenager who is entering adulthood.

The first menstruation (menarche) is the first menstrual blood discharge for adolescent girls which is one of the characteristics of puberty and the approach to adulthood of a girl in a healthy condition and not pregnant. This puberty period which is marked by menstruation is one of the signs of sexual maturity and biologically the female reproductive organs are ready and mature for reproduction, so it is very important to pay attention to. The age of first menstruation in adolescent girls is different for each person. However, in general menarche occurs at the age of 12-14 years depending on several influencing factors, namely health factors, nutritional patterns, lifestyle, and weight, because nowadays there is a decrease in the age of menarche to be relatively younger so that many elementary school students (Elementary Schools) have experienced menarche [17].

In addition to the physical symptoms that arise during menstruation, there are also changes in psychological symptoms of menarche, one of which is rejection of menarche, confusion, anxiety, and restlessness due to menstruation. This is due to the lack of understanding and knowledge of adolescent girls about the basics and changes that occur in themselves during menarche. When the time approaches for menstruation, each adolescent girl has a different attitude and response [17].

If a teenage girl has never discussed and talked about menarche with her parents, family, or friends, then the teenager will experience obstacles or difficulties. Preparation for menstruation can be done by providing information and

knowledge to teenage girls when facing menarche. With this method, teenage girls will feel relaxed, calm and comfortable and ready to face menarche. The most important and primary source of information is from their mothers and older sisters so they can share experiences. However, in reality, not all mothers can provide information and knowledge about menarche to their daughters, because they feel taboo about talking about menstruation and the limitations and lack of knowledge of mothers in conveying information about the first menstruation to their children, so a mother assumes that her child will later know about menstruation by herself [6].

How necessary it is to provide teenagers with knowledge and information on preparing to face menstruation, because the factor that plays an important role in the willingness and attitude to face menarche is knowledge. This is in accordance with the results of research in Tidore that there is a relationship between knowledge and the readiness of teenage girls to face menarche [18]. Teenage girls should be equipped with knowledge and science about menarche as preparation for self-care and personal hygiene during menstruation, such as changing sanitary napkins every four hours or when they feel uncomfortable or at least every two hours, the correct way to clean, because cleanliness of the reproductive organs is the beginning of maintaining women's vital organs [19].

One of the efforts that can be used to facilitate teenagers to get comprehensive information about reproductive health, especially facing menarche/first menstruation, is by designing an android-based application. Android-based applications can be designed and developed considering that today's teenagers are a generation born in the digital era and almost all have android-based smartphones [20].

The indicator of the success of this research is by testing the Menarche Preparation Application using the Blackbox Method.

**Table 1.** Test scenario testing Application initial display menu

Test Case Name		PERMEN application login test		
Test Objectives		Knowing the application functions as expected		
No	Skenario	Test Case	Expected results	Status
1.	User opens the application	User clicks on the application	The identity filling page appears	In accordance
2.	User enters name in Name column	User inputs Name	The Name column has been filled in	In accordance
3.	The user enters a mobile phone number in the mobile phone number column.	User enters mobile phone number	The mobile phone number column is already filled in	In accordance
4.	User logged in	User clicks the start button	User enters the main page of the PERMEN application	In accordance

**Table 2.** Test scenario testing Main menu of the application

Test Case Name		Test Menu of PERMEN application		
Test Objectives		Knowing the menu on the application is as expected		
No	Scenario	Test Case	Expected results	Status
1.	User accesses the main menu page	User clicks the start button	Go to the main menu page	In accordance
2.	User accesses the application menu	User clicks on the menu on the main menu page	A menu list appears	In accordance

#### 4. Conclusion

This study has successfully designed the “Permen: Persiapan Menarche” Application which contains materials on preparation for facing the first menstruation/menarche in adolescent girls, consisting of five sub-titles including: What is menstruation? Preparation for facing menarche (first menstruation), Menstruation Facts, Menstruation Myths, Behavior during Menstruation. The “Permen” application for adolescent girls can be further developed with more complete and attractive features and development in terms of the appearance and content of the Application.

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