

DIGITAL PARTOGRAPH: APPLICATION DEVELOPMENT WITH THE ADDITION OF THE EARLY BIRTH SCREENING FEATURE TO MONITOR LABOUR

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ABSTRACT

A partograph is a tool to monitor the progress of childbirth and make clinical decisions when observing childbirth. Partograph should be used by midwives regularly to ensure that mothers and babies receive safe, adequate, and timely childbirth care, and help prevent complications that can threaten life safety, but in reality, midwives still record partographs after childbirth is completed. This study describes the initial design and evaluation of digital partograph, an android-based application that aims to reduce morbidity and mortality during childbirth. The Digital Partograph adapts from the WHO paper-based partograph with a workflow designed to support monitoring during labor. This android-based digital partograph reduces some of the barriers to labor monitoring by using a paper-based partograph that has been proven to improve labor monitoring results. This study discusses the design made during implementation, largely driven by prototype testing with midwives at the Rancah Health Center. We then discuss the results of a preliminary study on the use of the app, which suggests that digital partographs can be used as a tool for labor monitoring and can improve maternal and infant care during childbirth.

Keywords: *Partograph Digital, Monitoring Labour, Midwifery*

INTRODUCTION

Every year, there are 210,000 maternal deaths during pregnancy, childbirth, and the postpartum period that are directly caused by obstetric problems (Hogan et al., 2010). The old partus is one of the causes of maternal death during childbirth. Sub-Saharan Africa had the highest maternal and infant mortality rates in 2019 at 223,000 per 100,000 and 27 deaths per 1,000 live births, followed by Central and South Asia. Maternal mortality in Indonesia ranks second only to Laos at around 305 per 100,000 live births, and infant mortality ranks 10th at 15 per 1,000 live births, much higher than Singapore which is only 0.8 per 1,000 live births. (Supas, 2015) The number of maternal deaths in West Java reached 745 people in 2020, while the number of babies born in the province reached 880,250 people and 2,891 people died. (Ministry of Health, 2021).

The partograph is a paper tool for recording clinical data during childbirth and has shown a reduction in stunted labor when used to track patients (World Health Organization, 1994). Supported by the World Health Organization, a partograph is a one-page set of charts and measurement tables that must be filled out during labor. The tool provides a standardized structure for the most relevant patient data, and the graphs visualize the progress of labor, making long deliveries clearer. Despite being a powerful tool, the complexity of a partograph can be difficult to fill in and interpret. The WHO in 2008 released a simplified version of the partograph. In 2011, Engender Health's Fistula Care and Maternal Health Task Force cited the complexity of the partograph as a major barrier to its use (Maine et al., 1999; MATHAI, 2009). In previous studies, it has been reported that many midwives who perform childbirth referrals do not carry a partograph, in fact, often the partograph is filled in after the delivery is complete (Ningrum et al., 2019)

The suitability and accuracy of filling the partograph have become a major issue in its widespread use. The applicability and accuracy of the partograph can be significantly improved

with the use of technology. The ubiquitous existence of relatively inexpensive smartphones presents opportunities, with well-designed android-based digital Partograph significantly improving the use and recording of the correct birth process. This study reports on the design and development of a digital version of the partograph that refers to the WHO standard partograph. The digital partograph app enhances the simplified Partograph by recording events during the active phase of labor up to 2 hours after delivery. In 2017 researchers developed a digital partograph and it has been used by several midwives in Ciamis Regency. In the research, the team will explain the addition of the initial filtering feature as the development of the digital partograph application version 3

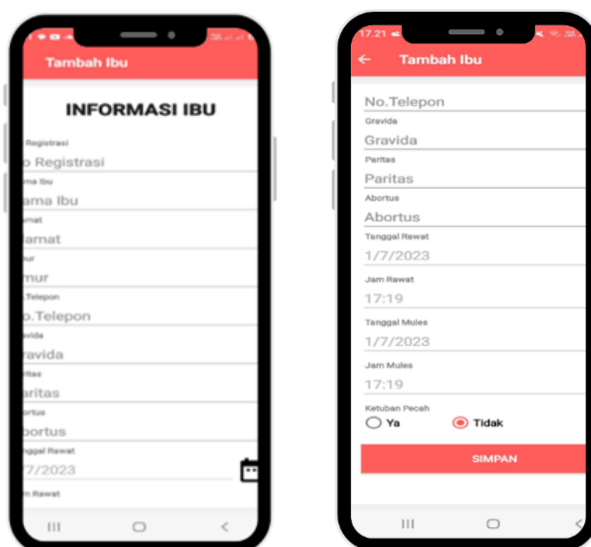
METHODS

This type of research aims to design an application. Therefore, the right research method is the Research and Development method known as Research and Development (R&D). Research and Development is a research method used to produce a specific product, and test the effectiveness of a particular product. Certain products can be produced by using research that needs analysis and to test the effectiveness of the product so that it can function in the wider community (Sugiono, 2017). The product produced in this study is in the form of software, namely an Android-based partograph application.

RESULTS AND DISCUSSION

1. DIGITAL PARTOGRAPH DESCRIPTION

The digital partograph application consists of a maternal information menu as the initial data that must be filled in when the midwife monitors childbirth. This mother's information is the client's identity that must be filled in when the client comes, consisting of registration number, name, address, age, phone number, gravida, para, abortion, date of treatment, hours of treatment, date of mules, hours of mules and condition of amniotic fluid when the client comes.

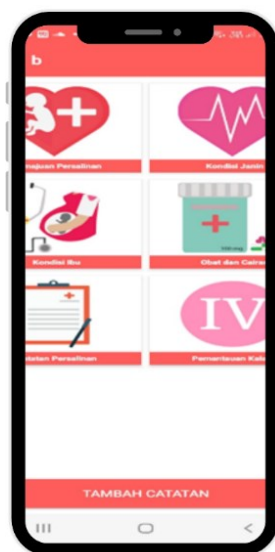


Digital Partograph Feature Image
Mother's Information

The main menu of the digital pulse graph consists of Fetal Condition, Labor Progress, Medications & Fluids, Maternal Condition, Birth Records, and Phase 4. In this menu, users/midwives need to record and monitor all maternity activities of pregnant women patients carefully and follow the applicable provisions in a recording. In each record that has been recorded by the user/midwife, the record is recorded and visible on the timeline of the use of the partogram application according to the name of the pregnant woman patient and the recording time carried out by the user/midwife.

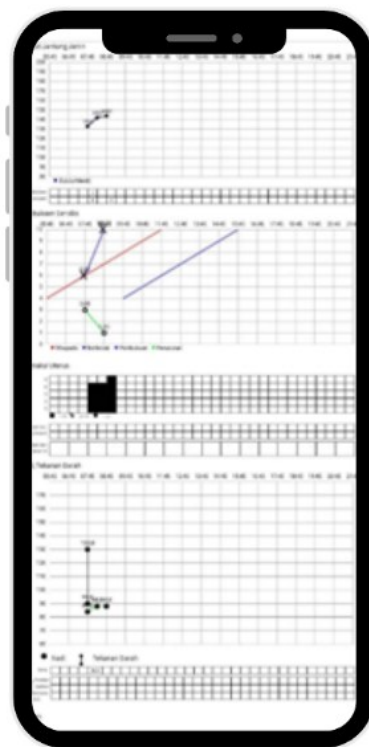
In this menu, users/midwives need to record and monitor all maternity activities of pregnant women patients carefully and by the applicable provisions in the recording. In each record that has been recorded by the user/midwife, the record is recorded and visible on the timeline of use of the partogram application according to the name of the pregnant woman patient and the recording time carried out by the user/midwife. This menu includes: Birth Progress, Fetal Condition, Maternal Condition, Medications & Fluids, Birth Records, and Period 4. (Ningrum, 2017)

The use of Birth Progress Form Fill Menu from the Fill Out Form consists of a Back button, an Add Note button, and a Pregnant Woman Patient Timeline. If the pregnant woman patient has been registered, the user/midwife can press "Childbirth Progress". If the pregnant woman patient is already registered and the user/midwife wants to record, they can press the "Add Note" icon with the picture to add to the recording of the pregnant woman patient that is monitored and recorded in the partograph. The user/midwife can select the form that is desired to be recorded in the partograph according to the needs of the birth record by sliding the smartphone screen to the right. The following is the form contained in the Progress of Childbirth Menu from the Fill Form consisting of the Back button, the Add Note button, and the Pregnant Women Patient Timeline. If the pregnant woman patient has been registered, the user/midwife can press "Childbirth Progress". If the pregnant woman patient has been registered and the user/midwife wants to record, they can press the "Add Note" icon with a picture to add to the record of pregnant women patients who are monitored and recorded in the partograph. The user/midwife can select the form that desired to be recorded in the partograph according to the needs of the birth record by sliding the smartphone screen to the right (Ningrum, 2017)



Digital Partograph Feature Image
Main Menu

A conclusion is a menu option if the user/midwife wants to see the results of recording and draw conclusions from the condition of the patient and fetus that has been monitored and recorded periodically in this partograph application. If the entire recording process has been carried out in the application, the user/midwife can select the Conclusion option on the Application Start page of the Conclusion Menu. In this menu, users/midwives have recorded and monitored all childbirth activities of pregnant women patients carefully and by the applicable provisions in the recording. In each record that has been recorded by the user/midwife, the record is recorded and a summary menu of the use of the partogram application can be seen by the Pregnant Woman's Patient Name and the recording time carried out by the user/midwife. Users can select the conclusion contained on the first page, then press the mother that has been recorded and recorded in the partograph in the previous recording, and then several descriptions of the delivery that has been carried out will appear. If the user wants to save the record, they can press the "save on your handphone" button, and then the partograph record has been saved on the handphone. (Ningrum, 2017)



Digital Partograph Feature Image
Conclusion

The advantage of digital partograph is that there is a notification system, which will sound in the form of an alarm if there is a complication of childbirth. The user/midwife who enters normal tidal data will automatically be recorded in the system, and an alarm will sound indicating that the maternity mother must be referred. In addition to the alarm that sounds, there is a display on the screen, pre-referral management that must be carried out by the midwife before the patient is taken to the hospital. This is certainly an advantage of digital partographs because the pre-referral management carried out is standardized (Ningrum, 2023).



Digital Partograph Feature Image
Notification of Childbirth Complication

2. DEVELOPMENT OF DELIVERY SCREENING MENU IN PARTOGRAPH DIGITAL

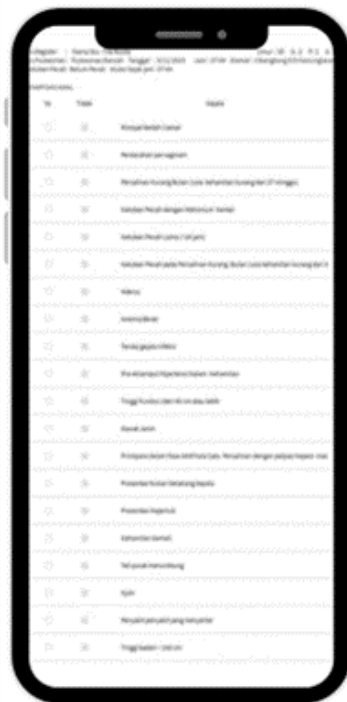
a. Analysis

The results of the study showed that, based on the first stage, the researcher explored the factors that answered the expectations and needs of the user related to the digital partograph model. Based on Focus Group Discussions and in-depth interviews, input was obtained to add an initial screening menu that would be useful for conducting early screening of labor before observation. This initial screening consists of 20 checks that must be filled out by the midwife after conducting an initial examination on the mother who will give birth. Early labor screening is an evaluation process carried out on pregnant women to identify risks and complications that may occur during childbirth. The purpose of prenatal screening is to ensure that pregnant women receive the right care according to their needs. Early screening of labor may involve physical examinations, laboratory tests, and other medical evaluations. Early screening of labor has undergone significant development. Various studies and innovations have been carried out to improve the effectiveness and accuracy of early labor screening. These studies aim to identify better screening methods, reduce the risk of childbirth complications, and improve labor outcomes. (Moh. Wildan, 2017)

b. Desain and Development

After the analysis stage by conducting Focus Group Discussions and in-depth interviews, the researcher then designs a Delivery Screening Menu that will be added to the application. There were 20 conditions of mothers that must be studied before deciding whether childbirth can be assisted or must be referred. These conditions include 1) History of Cesarean Section; 2) Bleeding per vagina other than mucus mixed with blood; 3) gestational age Less than 37 weeks (delivery less than a month) 4) Ruptured amniotic membranes accompanied by the release of thick meconium; 5) Prolonged rupture of the membranes (more than 24 hours); 6) Rupture of Amniotic Membranes in Childbirth Less than a Month (gestational age less than 37 weeks); 7)

the presence of signs or symptoms of infection; 8) Blood pressure is more than 160/110 and/or there is proteinuria (pre-eclampsia with exacerbation or severe); 9) Fundus height of 40 cm or more (macrosomia, polyhydramnion, multiple pregnancy); 10) DJJ less than 100 or more than 180 x/minute on two assessments with an interval of 5 minutes (fetal emergency); 11) Primipara in the active phase during one delivery with a decrease in fetal head 5/5; 12) Presentation not the back of the head (buttocks, latitude, etc.); 13) Double presentation (plural) (the presence of other parts of the fetus, for example: arms or hands, along with the presentation of the back of the head); 14) Umbilical cord is concatenated (If the pussus cord is still pulsating); 15) Signs and symptoms of hypovolemic shock; 16) jaundice; 17) Severe anemia; 18) Gemeli Pregnancy; 19) Accompanying diseases; 20) Height < 140 cm (JNPK-KR, 2017)



Digital Partograph Feature Image
Delivery Screening Menu

c. Implementation and evaluation

The development of the digital partograph application with the addition of the Delivery Screening Menu, has been tested for midwives who provide childbirth assistance at the Rancah Health Center of Ciamis Regency. The trial was carried out to determine the feasibility of the digital partograph application based on the responses and responses from midwives as users. Limited trial results are as follows: 1) The addition of a digital partograph menu helps midwives in conducting initial screening when they are going to monitor childbirth; 2) The addition of a digital partograph menu can motivate midwives to document the results of childbirth observations because it is easier to input data; 3) The addition of a digital partograph menu is very helpful for midwives in making early birth decisions; 4) Midwives can use the digital partograph application easily because it can be downloaded directly on the play store by searching for "digital partograph" then the application will be easy to find and download; 6) The addition of a digital partograph menu with a notification system makes it easier for midwives to carry out pre-referral management.

CONCLUSION

The addition of the Delivery Screening Menu to the digital partograph application helps midwives make it easier to make decisions when going to give birth assistance. The addition of a digital partograph application menu improves the existing digital partograph to record the progress of the entire process of childbirth to childbirth.

Limitations and Future Direction

The development of this digital partograph application refers to user input, it is possible that in the future other developments will be carried out based on needs, the trial in this study is still limited to a small group, namely midwives at the Rancah Health Center, the next research can be wider in scope.

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