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## Digital Partograph: A Way of Improving Quality of Partograph Use During Labour Monitoring Process

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### **Abstract**

*Partographs are one of the ways to improve labor outcomes. In the meantime, the use of paper as media has been regarded as barriers that prevent it from fully utilized. Furthermore, this paper reports the quality of applications that was originally designed by the researchers as an android based application that intends to lessen passing and injury in labor used for monitoring labour progress and depicts the plan and fundamental assessment of the computerized partograph. Moreover, this study used a descriptive method and included 45 respondents, all of them used the digital partograph by using cases as data that is used to be filled into the digital partograph. Furthermore, the data were collected by distributing an ISO/IEC 9126 questionnaire and analyzed using expressive investigation strategies. Therefore, Aftereffects of this review demonstrate that among quality elements of the advanced partograph, usefulness is the most elevated. Furthermore, through exploratory examination and a client focused plan measure, we made and created computerized partograph to help with quality checking care in labor wards*

*Keywords: digital partograph, quality of partograph, ISO/IEC 9126*

### **Abstrak**

*Partograf merupakan salah satu cara untuk meningkatkan hasil saat persalinan. Selama ini penggunaan partograf kertas dianggap sebagai hambatan yang menghalangi pemanfaatannya secara maksimal. Penelitian ini menggambarkan kualitas aplikasi partograf digital yang dirancang oleh peneliti sebagai aplikasi berbasis android yang bertujuan untuk mengurangi kematian dan cedera pada persalinan, yang digunakan untuk memantau kemajuan persalinan, dengan menggambarkan desain dan evaluasi partograf digital. Penelitian ini menggunakan metode deskriptif dengan melibatkan 45 responden. Semua Responden menggunakan partograf digital dengan menggunakan kasus sebagai data yang digunakan untuk diisi ke dalam partograf digital yang diberikan oleh peneliti. Data dikumpulkan dengan menyebarkan kuesioner ISO/IEC 9126 dan dianalisis menggunakan teknik analisis deskriptif. Hasil penelitian ini menunjukkan kualitas partograf digital dimensi fungsionalitas adalah yang tertinggi. Selain itu, melalui penelitian eksplorasi dan proses desain yang berpusat pada pengguna, kami membuat dan mengembangkan partograf digital dengan tujuan untuk membantu pemantauan persalinan.*

*Kata kunci: partograf digital, kualitas partograf, ISO/IEC 9126*

## INTRODUCTION

Maternal Mortality Rate and Infant Mortality Rate in Indonesia remain the highest in Southeast Asia with 90% of maternal passings happening around the hour of conveyance. Moreover, the majority of global maternal deaths continues to be a health concern in some specific areas in developing country (Zelee & Tegegne, 2018) and specifically in low-and center pay nations in regards to the worldwide weight of preventable maternal passings (Patabendige *et al.*, 2021). In addition, 95% of maternal deaths are caused by obstetric complications which are often unpredictable (Perkumpulan Obstetri dan Ginekologi Indonesia, 2017). On the other hand, the primary confusions are Postpartum discharge, uterine break, fistula, puerperal sepsis and asphyxia, fetal demise, and neonatal sepsis (Melese *et al.*, 2020). Therefore, when giving maternity care, the helper must be aware of the problems or complications that might occur. Some efforts that have been made by the government to reduce the current maternal and infant mortality rate are mandatory for each birth to be carried out by health workers (Saiffudin, 2009). In addition, the World Health Organization (WHO) aggressively recommend the utilization of partograph (Melese *et al.*, 2020) that significantly indicated and associated with improved maternal and neonatal outcomes of labour (Zelee & Tegegne, 2018). Furthermore, there are various ways to deal with maternal deaths, one of which can be prevented by handling labour by health workers in a comprehensive manner. One effort that can be done in supporting this program is the use of partographs during the process of monitoring labor (Space, 2002). The partographs was designed as a tool for recording clinical data during childbirth (Schweers *et al.*, 2016) to help the course of work which presents a calculation for surveying

maternal and fetal conditions and work movement that can lessen unfriendly pregnancy results (Rahman *et al.*, 2019)

A partograph is the most normally utilized apparatus for work checking, broadly upheld by wellbeing experts and suggested by the World Health Organization (WHO) for observing during dynamic periods of work (Bedwell *et al.*, 2017). In addition, Partograph (here and there called partogram) is a work checking apparatus that is utilized in nations worldwide to empower early identification of inconveniences, so reference, activity or closer perceptions can result (Lavender & Bernitz, 2020) which distinguished as a graphical show of a lady's advancement of work (Neke & Motupa, 2013). Moreover, this tool must be used for all mothers in the active phases of normal labor as an important element of labor for monitoring in order to evaluate and make decisions as to normal and complicating parturition (Space, 2002). The use of a partograph can ensure that the mother and baby get safe, adequate and timely labor, and help prevent complications that can threaten the safety of their lives. Furthermore, it can be used for monitoring the cause of cervical dilatation to accelerate labour requires by looking at the partograph alert line (Oladapo *et al.*, 2017). On the other hand, The usage of a partograph is as of now extremely low, with the accompanying elements influencing its use: practically zero information on the partograph (85.4%), nonavailability (70%), deficiency of staff (61.5%), and the way that the time has come burning-through to utilize (30%). (Asibong *et al.*, 2014).

The current development of science and technology in the field of health is very rapid, and it is very important to apply such development to save human life. Some of the benefits of technology and information,

including obtaining information quickly and easily, and time and cost efficiency, as well as facilitating communication are now a phenomenon in the wider community. In addition, the communication that conducted using such electronic media to record the medical practice gives impact to the relation of medical worker and patient (Alkureishi *et al.*, 2013). Moreover, the partograph itself supports decision-making of health professionals during labour to reduce labour complications (Souza *et al.*, 2015). in line with the use of technology, another term comes to enlighten the comprehension of the use of it in such a device. The partograph use can be identified as a tablet-based application developed to improve care for women in labour by addressing documented challenges that is called the Partogram (Litwin *et al.*, 2018). The use of technology affects quality of care during this period that is critical to the survival of pregnant women and their babies (Oldapo *et al.*, 2015). Regarding the aforementioned statement, the researchers innovate by creating the android based application namely Partograph Digital that refers to the use of partograph through device which is applicable as a tool to assist medical care and ease them during labour monitoring that could be downloaded on Google Play Store. The application carried out digital use instead of manual paper for monitoring that was authentically designed by the researchers. Therefore, the Partgoraph Digital which was originally designed by the researchers can be used for delivery monitoring as the aid of technological utilization in obstetrics services even better.

## METHOD

The research began by drafting the instruments to assess the application. Before taking the data, the first thing to do was to identify respondents based on the criteria set by the researcher, followed by giving respondents approval if they agreed to fill in questionnaires for data collection. The research used a descriptive design and total sampling, with the sample consisting of 45 respondents in total, all

To improve the quality of the digital partograph used, the latest version of digital partograph has been released, i.e. version 3.0. In this version, there are bug fixes, design changes, additional info features, and additional features to back up and restore data. With the upgrade of the digital partograph application, it is expected that users, especially midwives, can use it more easily and faster, and its quality will be even better (Ningrum, 2019). ISO/IEC 9126 is a standard for products, especially software that includes quality and metric models. Thus, factors regarding the taxonomy of quality software will be explained. In the ISO/IEC 9126 standard, the characteristics described are sub-characteristics as benchmarks for software, which become a framework for evaluating software (Rosalina V, 2017). Six attributes of the product quality model are: (1) Functionality, for example the capacity as far as elements of programming items that give fulfillment to client needs; (2) Reliability, for example the capacity of programming to keep up with a degree of execution; (3) Usability, for example a trait that shows the degree of simplicity of activity of the product; (4) Efficiency, for example identified with execution time and capacities identified with actual assets utilized when the product is run; (5) Maintability, for example the degree of comfort of the product in obliging changes; and (6) Portability, for example the capacity identified with programming abilities that are shipped off various conditions (Rosalina V, 2018).

of them were midwives who used digital partograph applications. Data retrieval was done after the respondents used digital partograph application with 3 cases given. Data retrieval started by giving respondents cases, 15 minutes for each case. Then, they were asked to fill in an ISO/IEC 9126 questionnaire. The results of the questionnaire were collected and then taken to be analyzed by the researchers

assisted by an enumerator. Additionally, data were presented in the form of distribution of the value of the data retrieval result. The process

recording data and information menu of patients in the active phase of labor in digital partograph are shown in Figures 1 and 2.



Figure 1. Patient labor information menu of digital partograph

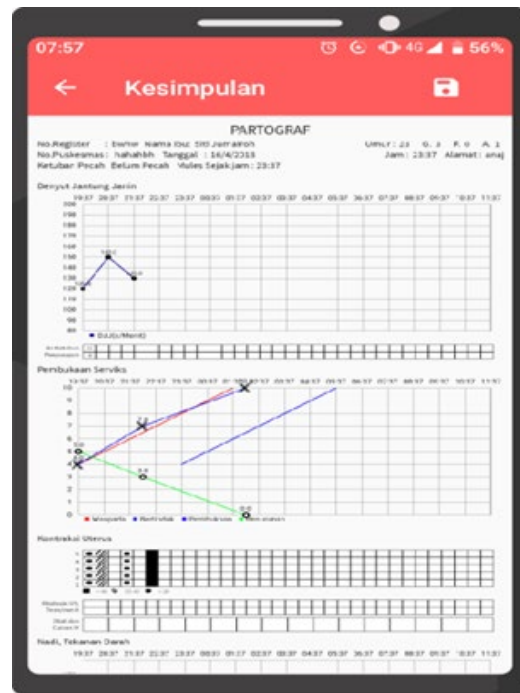


Figure 2. The process of taking data and recording information of a patient in the active phase of labor using digital partograph

**RESULTS AND DISCUSSION**

**Characteristics of Respondent**

This study shows that on average, respondents' age is (45.48± 5.34) years with the age range from 30 to 55 years. The average respondents attended D III in Midwifery. The qualities of the respondents are displayed in Table 1.

Table 1  
*Characteristics of respondents*

Characteristics	Number of Respondents (N)	Percentage (%)	Mean± SD
Age	30 - 35	2	5.71
	36 - 40	2	5.71
	41 - 45	13	37.15
	46 - 50	13	37.15
	50 - 55	5	14.28
Education Level	D III	23	65.71
	D IV	22	34.29

**Overview of Digital Partograph Quality Used during Labor Monitoring Process**

Table 2



*Distribution and average partograph digital quality dimension used during labour monitoring process*

Variable		Min-Max	Mean± SD	Category
Quality		27-55	38.25± 5.62	
Sub-variable	Functionality	7-16	12.4± 2.30	Very good
	Reability	1-3	2.08± 0.37	Good
	Usability	4-9	5.85± 0.91	Good
	Efficiency	5-10	7.80± 1.41	Very good
	Maintenance	3-9	6± 1.08	Very good
	Portability	2-7	4.11± 1.02	Very good

The results of intervention were analyzed using a computerized test, which indicate that the median rank (Me) is equal to 38.25, that was occurring in the respondents could be known. Distribution of the data from the questionnaires of digital partograph quality dimension used during the labor monitoring process of all respondents, consisting of quality dimensions, can be seen in Table 2. Based on Table 2 above, it can be seen that the average quality of digital partograph in this study was (38.25± 5.62). The average functionality, reliability, usability, efficiency, maintainability, and portability of digital partograph in this study were (12.4±2.30), (2.08± 0.37), (5.85±0.91), (7.80±1.41), (6±1.08), and (4.11±1.02), respectively.

The digital partograph is a center part of checking work. It is produced as the client enters test estimations, killing dreary and blunder inclined manual diagramming. It shows up before each test and is available consistently, one tap away from the application's primary work screen.is a core component of monitoring labor. It is generated as the user enters exam measurements, eliminating tedious and error-prone manual graphing. It appears before every exam and is accessible at all times, one tap away from the application's main work screen. (Schweers *et al.*, 2016) The presence of an application suggests that the end client has some unfulfilled need. However adjusting to change, even certain change, has an expense.

**LIMITATION OF THE STUDY**

The constraints of the review are those qualities of plan or philosophy that affected or impacted the understanding of the discoveries from this exploration. The information assortment which is finished by offering cases

The new usefulness must be offset with the client's requirement for commonality.

Since a center piece of advanced partograph is digitizing the paper partograph, we had a progression of choices concerning how near emulate the paper device. Any deviation would mean re-preparing staff who definitely realized how to utilize the paper adaptation, however holding fast precisely to the paper rendition could mean botching freedoms to further develop care characteristics. From an information representation point of view, the most uncommon part of the customary partograph is the treatment of patients progressing from inactive to dynamic work which can rely upon checking work. (Bernitz *et al.*, 2019)

Predictable with the writing, we viewed partograph use to be conflicting, not with standing the Indonesian public rule that essential wellbeing habitats finish up a partograph for each birth to execution norms fundamentally further developed work observing and entanglement avoidance works on during labor.(Tholandi *et al.*, 2019) A large portion of pregnant, maternity and labor mortality can be forestalled with observing partograph (Nudhira *et al.*, 2017)(Gans-lartey *et al.*, 2013) Some intrapartum care rehearses advance vaginal birth, while others might build the danger for cesarean area (King, 2012), including consistended of digital partograph.

to the respondents, as an initial stage for testing the quality of the digital partograph application. This research stage is testing the quality of the partograph by using cases that are designed like real conditions.

**CONCLUSIONS AND SUGGESTIONS**

Through exploratory examination and a client focused plan measure, we fostered the advanced partograph to help with quality checking care in labor wards. An advanced partograph is a significant part to assist clinicians with recognizing drawn out and hindered work rapidly while keeping away from the ease of use hardships that cheapen paper partographs. Computerized partographs fuse an arrangement of updates, choice help for crises, and backing for the full tolerant lifecycle, from affirmation until conveyance or carried out directly to pregnant women.

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### CONFLICT OF INTEREST STATEMENT

There is no conflict of interests

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