APPLICATIONS TO MONITOR MATERNAL HEALTH IN PREVENTING STUNTING

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ARTICLE INFO

Received:
Revised:
Approved:

ABSTRACT

Adequate nutrition during pregnancy affects the incidence of stunting. Every pregnant woman is encouraged to have regular prenatal checkups. But many pregnant women and nursing mothers do not routinely do checkups. They even lost a book to monitor Maternal and Child Health, so the examination history was not fully documented. This creates problems such as incomplete patient data, and midwives having difficulty finding patient history. The purpose of this study is to develop an application to monitor maternal health. Monitoring is also carried out to help detect early if there are potential abnormalities or health problems for the mother and fetus. The research method uses the Rapid Application Development (RAD) approach, by developing computer applications to monitor maternal health. The results show that this application can produce information on the history of physical examinations on patients more quickly and accurately. Reports are presented in the form of printouts and graphics. The graphic display makes it easier for the midwife to read the progress of the patient's health. Midwives are also faster in detecting abnormal patient conditions, so midwives can immediately provide education, action, or therapy.

KEYWORDS

Quality of health services, stunting, pregnant women, midwives, maternal, fetuses, and child health.

INTRODUCTION

Data for the third quarter of 2021, it has been reported that the Maternal Mortality Rate (MMR) has reached 867 cases. Previously, there were 530 cases of maternal mortality in 2020. Limited health and nutrition services for pregnant women during the pandemic, potential virus exposure, and pregnancy complications (hemorrhage,

pregnancy hypertension, heart disease, diabetes) are factors that are expected to influence the increase in maternal mortality.

Stunting is a form of growth failure (growth faltering) due to the accumulation of insufficient nutrition that lasts for a long time starting from pregnancy until the age of 24 months. Stunting can increase the risk of delayed motor development and retarded mental growth, even death(Tuah, 2015). Prevention of stunting starting from the beginning of pregnancy must be done to reduce the incidence of stunting in children. The incidence of stunting can occur during pregnancy due to inadequate maternal nutritional intake during pregnancy, inappropriate eating patterns, and low food quality resulting in stunted growth(Nurfatimah et al., 2021).

After the Covid-19 pandemic, there are still many mothers who do not routinely carry out pregnancy checks, and or do not routinely take their children for immunization. Many mothers say to have lost the MCH book (Maternal and Child Health) which contains a history of pregnancy. The MCH handbook is given to every pregnant woman who comes to the midwife/public health center(Widagdo & Husodo, 2009)(Rina Hanum, 2018). So far, midwives record patient history based on a handwritten visit book. If the patient comes to visit again, the midwife finds it difficult to find a history of previous examinations, especially when she has changed books. As a result, the process of detecting of nutritional status of pregnant women takes a long time and the results are less accurate. Other problems are non-continuous medical record data and difficulty in searching data(Widodo & Farida, 2018).

The low compliance of patients carrying MCH books during examinations resulted in problems, namely: (1) incomplete patient data, (2) unsustainable patient data, (3) midwife records there were many books, (4) midwives had difficulty finding patient history, (5) medical history. immunization of mothers and children is not recorded properly, and (6) midwives have difficulty detecting the growth and development of toddlers. This results in a decline in the quality of maternal health services, and an impact on patient satisfaction (Nnebue et al., 2014). When the history data is not recorded properly, the provider must look for it, this causes the patient waiting time to be longer. Long patient queues will hinder the utilization of maternal health services(Uzochukwu, Onwujekwe, & Akpala, 2004).

The solution to overcome this problem is the need to develop an information system that can make it easier to record patient data for mothers. The purpose of this research is to develop an application to monitor maternal health. The point is to present complete and accurate patient data. Monitoring is carried out to help detect early if there are potential disturbances or abnormalities in pregnant women. The midwife will be faster in making decisions when assisting childbirth.

RESEARCH METHOD

The research steps in developing applications to monitor the health of pregnant women are as shown in the following picture:

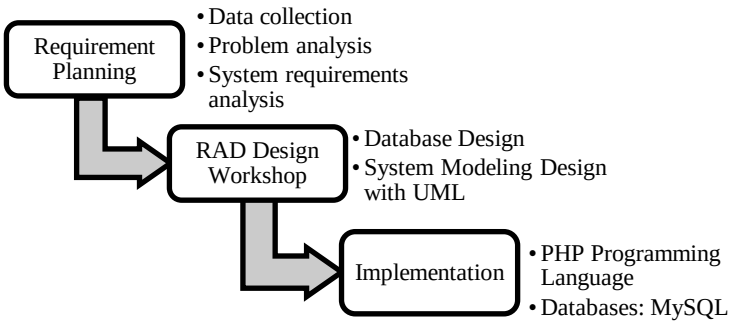

Figure 1. Research Stages

Requirement Planning

Data were collected by observing and interviewing data needs during the ongoing examination of pregnant women at PMB Dewi Candraningrum. Then analyze the data needed by midwives and patients. Researchers also analyze what needs can be used in application development.

Rapid Application Development (RAD) Design Workshop

The researcher designed the database design including tables, user interface design, and the design of the input and output processes. The tools used in designing the system are use cases, activity diagrams, sequence diagrams, and class diagrams.

Implementation

Researchers worked with PMB Dewi Candraningrum intensely. After the application is approved, the application is tested and implemented. In this study to write application program code using the PHP and MySQL programming languages as databases

RESULT AND DISCUSSION

Data were collected through interviews with the midwife Dewi Candraningrum. The data taken included the results of the examination of pregnant women which included the patient's identity, history of pregnancy, maternal, illness, contraception, and physical examination.

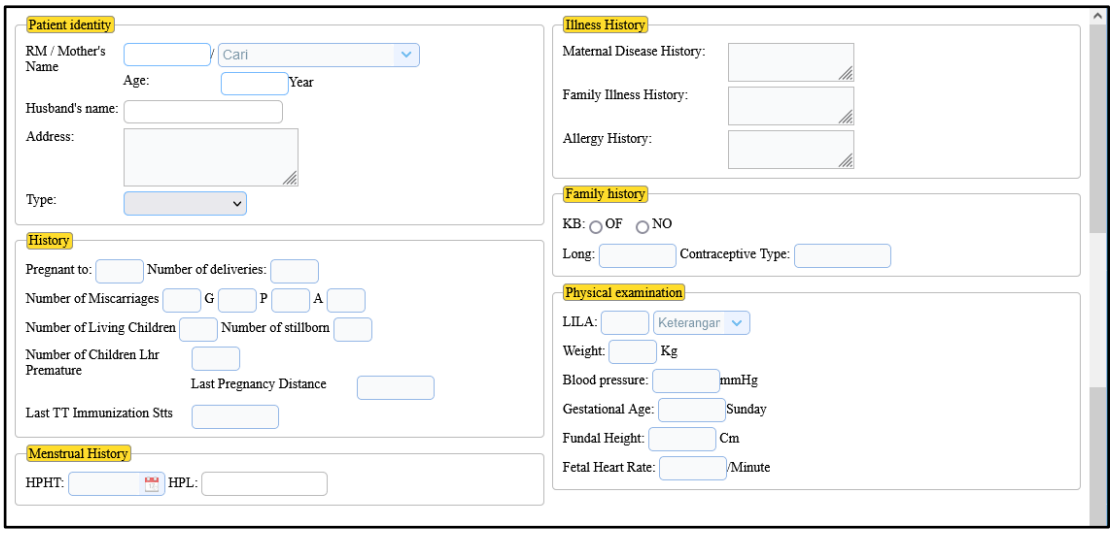

Figure 2. Form for the Input of Maternal Patient Visits

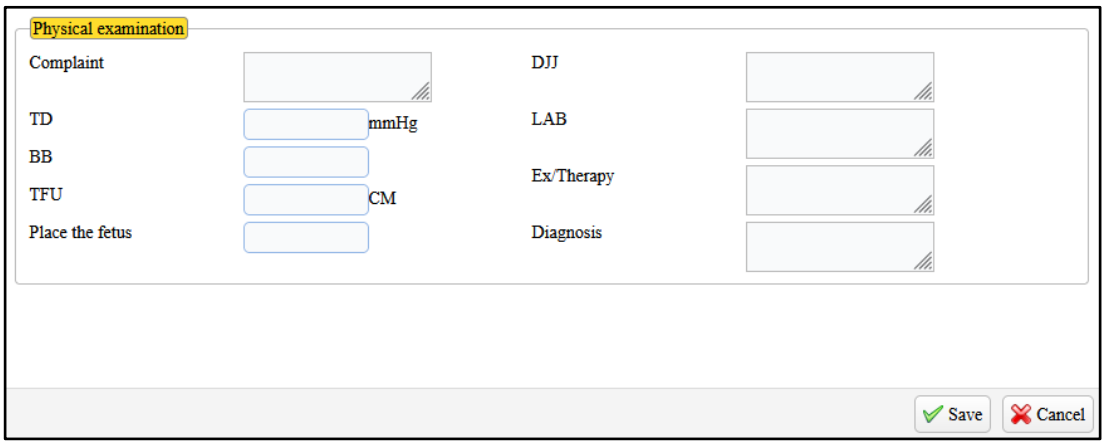

Figure 3. Form To Input the Patient's Physical Examination

After inputting the results of the physical examination of pregnant women, the following examination history can be displayed:

PMB-DEWI CANDRANINGRUM

Address : Jetis RT/RW03/07, Alastuwo, Kebakkramat, Karanganyar

PATIENT IDENTITY

Number of Registration : RG19090004
Patient's name : MARTINI Husband's name : SARWONO
Date of Birth : 1991/10/05
Religion : Islam
Education : Senior High School
Profession : -
Address : Kebakkramat, Karanganyar

MENSTRUAL HISTORY

HPHT	HPL
2021/12/09	2022/09/30

ILLNESS HISTORY

Maternal Disease History	Family Illness History	Allergy History
Anemia	DM	Wheezing
Hypertension	Hypertension	

HISTORY OF CONTRACEPTION

Type	Duration (M)	Effects
IUD	25	Fat
Inject	6	Irregular menstruation

PHYSICAL EXAMINATION

Date	Age (Week)	Blood pressure (mmHg)	Symptom	Weight (Kg)	TFU (Cm)	Pulse (Minute)	Diagnosis
2022/04/19	16	130/90	nausea, no appetite	54	21	100	hypertension
2022/05/20	20	130/90	morning sickness	54	22	110	hypertension
2022/06/27	24	130/90	Bleeding gums	57	24	140	hypertension
2022/07/18	28	140/100	edematous	60	25	160	pre-eclampsia
2022/09/02	32	150/100	edematous	65	28	170	pre-eclampsia

Figure 4. The Output of The Patient's Physical Examination

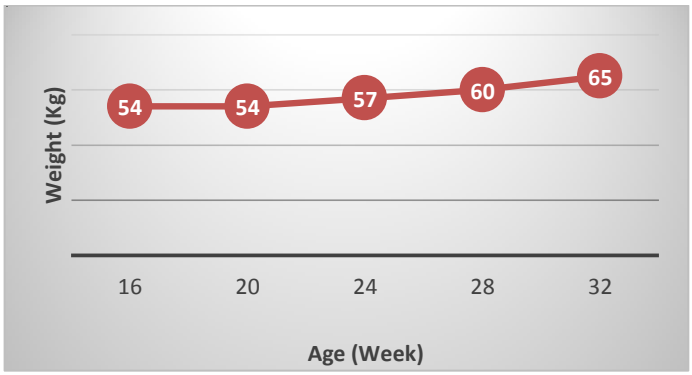

Figure 5. Example of a Graphic Display of Physical Examination Results

Maternal health monitoring applications can assist midwives in inputting patient physical examination data during pregnancy. Maternal health reports can be presented in graphic form and can be printed. Graphs can be set to present maternal health data through weight based on gestational age. This is useful for detecting malnutrition in pregnant women which can later have an impact on low birth weight and low height for age(Harizal, Neherta, & Yeni, 2021). The risk factor for birth weight less than 2,500 grams also influences the incidence of stunting in children under five years in Indonesia(Fikawati, 2017).

Midwives have an important role in stunting prevention, namely by monitoring maternal health during pregnancy. Midwives must immediately decide on the appropriate action or therapy when they find a pregnant woman who is malnourished. Midwives must also educate mothers to provide nutrients for the first 1000 days of a child's life(Sutriana, Usman, & Umar, 2020). If the history of maternal examination during pregnancy can be captured properly, it will support the quality of delivery in every health care provider (DeJong, Akik, El Kak, Osman, & El-Jardali, 2010)..

CONCLUSION

Computer-based maternal health monitoring can help prevent stunting. This application can produce information on the history of physical examinations on patients more quickly and accurately. Reports are presented in the form of printouts and graphics. The graphic display makes it easier for the midwife to read the progress of the patient's health. Midwives are also faster in detecting abnormal patient conditions, so midwives can immediately provide education, action, or therapy.

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