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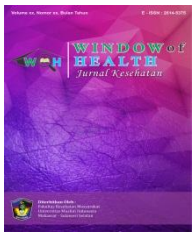

ARTICLE RESEARCH

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Development of Midwifery Documentation System In Web-Based Pregnancy Care

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ABSTRACT

Documentation of pregnancy care is very important to monitor the health of the mother and the fetus she is carrying; often, this documentation is still done manually and sometimes irregularly. There is a need for a midwifery documentation system that can assist students in recording data regularly and accurately. SOAP of Midwifery Documentation (MD-SOAP) is a web-based documentation system designed based on the needs in documenting pregnancy care, starting from a thorough assessment of the patient's basic data, diagnosis, care planning, implementation, and evaluation based on the Varney mindset with SOAP documentation that is written in narrative. The purpose of this study was to identify the need for midwifery documentation in pregnancy care and design a prototype of SOAP of Midwifery Documentation (MD-SOAP). This research method is Research and Development (R&D) to design a prototype of SOAP of Midwifery Documentation (MD-SOAP). The sample of this study was part of the Midwifery Study Program students of STIKes MERCUBAKTIJAYA Padang, as many as 88 students. Data collection techniques by filling out questionnaires. Analysis of this research is descriptive, quantitative, and qualitative. The results of this study are the need for web-based midwifery documentation, obtained 100% of students stated the need for web-based documentation. So far, they have used documentation by handwriting methods, 83% understand the use of computers, and 72.4% understand the use of the web. The features available in MD-SOAP cover all aspects needed in pregnancy care. MD-SOAP has also been validated by media experts and midwifery experts specializing in pregnancy care, all of whom stated that this web is suitable for use. The results of this study conclude that the MD-SOAP web is suitable for use by students in documenting pregnant women.

Keywords : Pregnancy Care Assessment; Midwifery Documentation; Web-Based System

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INTRODUCTION

Every health worker, including midwives and midwife students who provide health services to clients, must document all the results of activities that have been carried out. Documentation is very important because it can be used as an accountability material for actions that have been taken (1–4). Documentation of pregnancy care is very important to monitor the health of the mother and the fetus she is carrying. However, often this documentation is still done manually and sometimes irregularly. This can lead to errors in recording data and difficulties in monitoring the development of pregnanc (5,6). The documentation carried out by students during practice is mostly dominated by manual recording, namely in the form of logbooks. So that it takes time to write the results of the assessment that has been done, possibly resulting in data missing (5–8).

Preliminary studies conducted on June 20, 2023, on 10 midwifery undergraduate students who were practicing in the field said that they were overwhelmed in making handwritten notes on the results of the pregnancy midwifery care study that had been given. They take a long time in making pregnancy documentation Some students said, "... it takes a long time to make it what else if we write wrong we can repeat it so that the recording looks neat and can be read. Moreover, one format has a lot of data that must be filled in". Some say ".... sometimes after we make a record, we are confused about storing it so that it stays neat and not messy, especially when we go home from practice, it rains, we are afraid that our documentation will get wet and damaged.". They hope for a system that makes it easier for them to take notes so that they can focus on the care provided.

The results of interviews from several midwifery study programs in the city of Padang show that the documentation method applied to students is 70 % manual and 30% computerized, and it is not uncommon for them to have difficulty checking student documentation manually because of unclear writing. Some midwifery study program lecturers (62%) also said that if the documentation uses computerization, it is feared that plagiarism is high, so it is recommended to use the manual. Based on that, there is a need for a midwifery documentation system that can assist students in recording data regularly and accurately. One solution is to use a website-based midwifery documentation system so that it can replace the manual documentation that has been done by students.

Several studies have been conducted related to the documentation of midwifery care in web-based pregnancy (7–18). One of the relevant studies is research conducted by Elviana Datulinggi et al (2019), which shows that a web-based documentation system can increase effectiveness, efficiency, and plagiarism-free documentation in documenting obstetric care in pregnancy because the data must be filled in directly by students. Existing patient data cannot be transferred to other patient data (7).

Documentation model based on Computer-Based *Patient Record* (CPR) is a documentation model that uses computerization in recording the results of the assessment conducted on the client/patient. The CPR model is in the form of all forms of programmed records, making it easier for midwives or students to diagnose and reduce manual documentation activities. Some considerations in

using CPR in midwifery documentation are that the amount of data reviewed by midwives and students in midwifery care, including assessment in pregnancy care, is very large, and this method is a more efficient and effective introduction (1,3,4).

Some researchers continue to strive to develop prototypes of web-based *midwifery* documentation systems, such as research conducted by Cut Mutiah et al (2022), where they designed a prototype of web-based *midwifery* documentation for childbirth care called *Case Midwifery Notes* (CMNotes). The results of the implementation using CMNotes show that the system provides convenience and satisfaction for students in making labor care documentation (13). Erlin Nur Fatma also developed a web-based midwifery service application, which focuses more on patient service management in independent practice clinics in general (19). Not only that, other researchers have also developed web-based documentation applications, such as Wahyu Fadjri, who developed a web-based obstetric assessment medical record information system, focusing on accelerating hospital clinic assessment services (11).

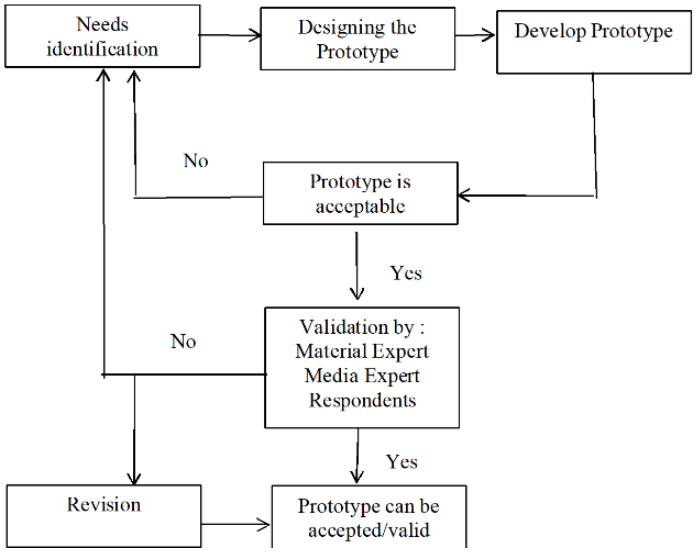
Based on this, the researcher is interested in developing web-based *midwifery* documentation for pregnancy care with narrative documentation techniques, with the SOAP documentation model called *SOAP of Midwifery Documentation (MD-SOAP)*. *SOAP of Midwifery Documentation (MD-SOAP)* is a web-based documentation system designed based on the needs in documenting pregnancy care, starting from a thorough assessment of patient basic data, diagnosis, care planning, implementation, to evaluation based on the Varney mindset with SOAP documentation that is written in narrative. The SOAP documentation model named *SOAP of Midwifery Documentation (MD-SOAP)* will be duplicated, so that students cannot transfer previous patient data to the next patient, and lecturers' concerns about plagiarism are reduced. Lecturers will find it easier to check student documentation because the records are clear and easy to read.

METHODS

This research method is *Research and Development* (R&D) to design a prototype of *SOAP of Midwifery Documentation (MD-SOAP).* The sample of this study was part of the Midwifery Study Program students of STIKes MERCUBAKTIJAYA Padang, as many as 88 students. The steps in developing MD-SOAP include the stages of analysis, design, development, implementation, and evaluation (ADDIE). The analysis stage first assesses whether or not it is important to make web-based documentation, where the data needed is the student's understanding of midwifery documentation, understanding of operating a computer/laptop, and understanding of the web. This design stage, MD-SOAP, will be designed based on the results of the analysis that has been done in the previous stage. In the development stage, the MD-SOAP design is shown to experts to assess whether this web is effective or not, and to improve MD-SOAP as suggested by the experts. The experts used here are media experts and midwifery experts, especially in pregnancy care, with as many as three people each. In this implementation stage, the MD-SOAP that has been improved according to the experts' suggestions will

be tested on students to see whether the MD-SOAP is valid, reliable, and effective so that it can be measured.

Data collection techniques involve filling out questionnaires. The data was checked after being filled in correctly, and all items had been answered by the respondents. Then, data processing was carried out by editing, coding, entry, *tabulating,* and *cleaning*. The data analysis technique used in the research is descriptive qualitative and descriptive quantitative analysis, which describes the results of validation and student responses to the *SOAP of Midwifery Documentation (MD-SOAP)* prototype in web-based pregnancy care developed.



Research Flow Picture

RESULTS

Midwifery documentation needs in pregnancy care

Table 1 Distribution of Needs Midwifery Documentation in Pregnancy Care Students Midwifery Study Program STIKes MERCUBAKTIJAYA Padang

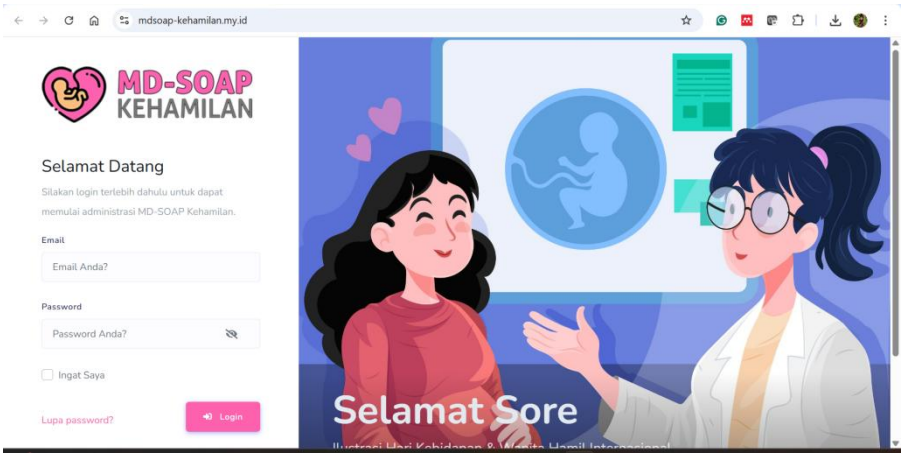
Variables	Frequency	
	n	%
Computer/Web-Based Documentation		
Need	88	100
Not necessary	0	0
Documentation Method		
Handwriting	88	100
Using a Computer	0	0
Understanding of computers		
Understand	73	83
Not Understanding	15	17
Understanding of the web		
Understand	64	72,4
Not Understanding	24	27,6

In Table 1, 100% of students stated the need for web-based documentation; so far, they have used handwritten documentation, 83% understand the use of computers, and 72.4% understand the use of the web.

Design of Midwifery Documentation System in Web-Based Pregnancy Care

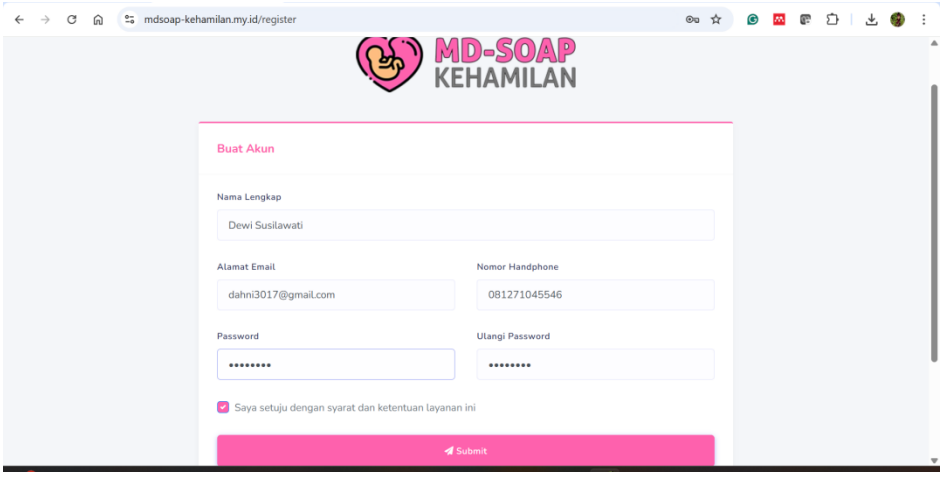
The name of this web-based *midwifery* documentation system in pregnancy care is SOAP of *Midwifery Documentation (MD-SOAP),* with a web page https://www.mdsoap-kehamilan.my.id/. The features on the web are as follows.

Log in View



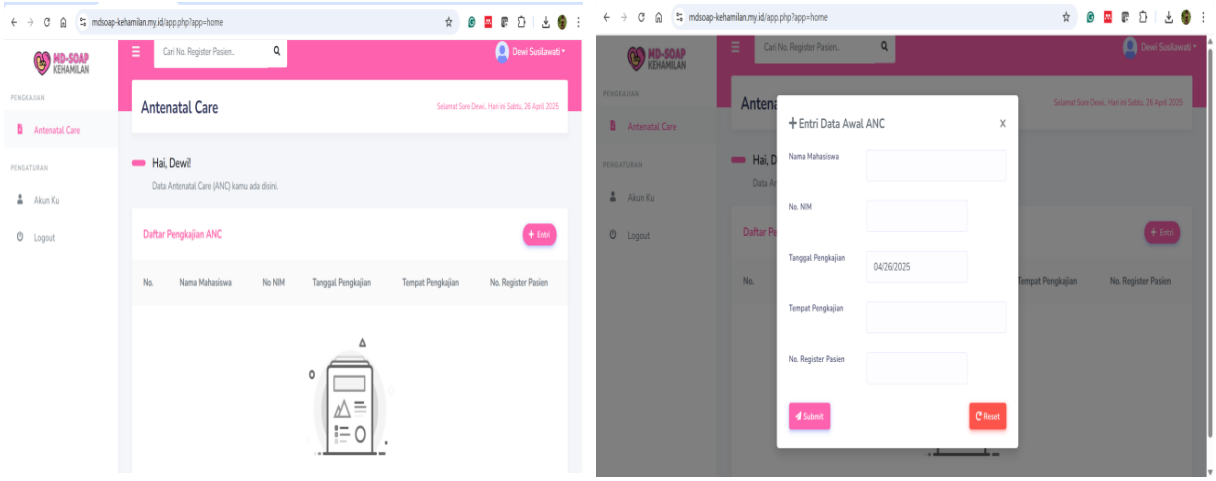
On this pag,e students can create their account by creating an account first. https://www.mdsoap-kehamilan.my.id/

Registration View



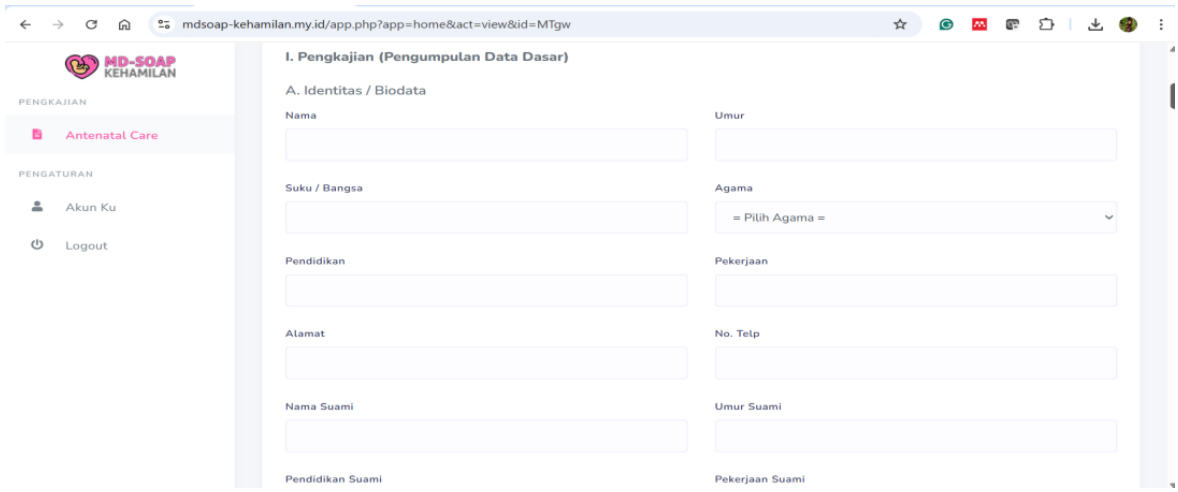
This page is a page for registration Here, the data required is full name, email, password,and cellphone number. https://www.mdsoap-kehamilan.my.id/register

Home View



On this page, students can enter the initial ANC assessment data to make it easier for students to find patient data that has been assessed. By clicking **+entry**, what is needed at this stage is the student's name, NIM, date of assessment, place of assessment, patient registration number. https://www.mdsoap-kehamilan.my.id/app.php?app=home

Complete patient data acknowledgment page to SOAP

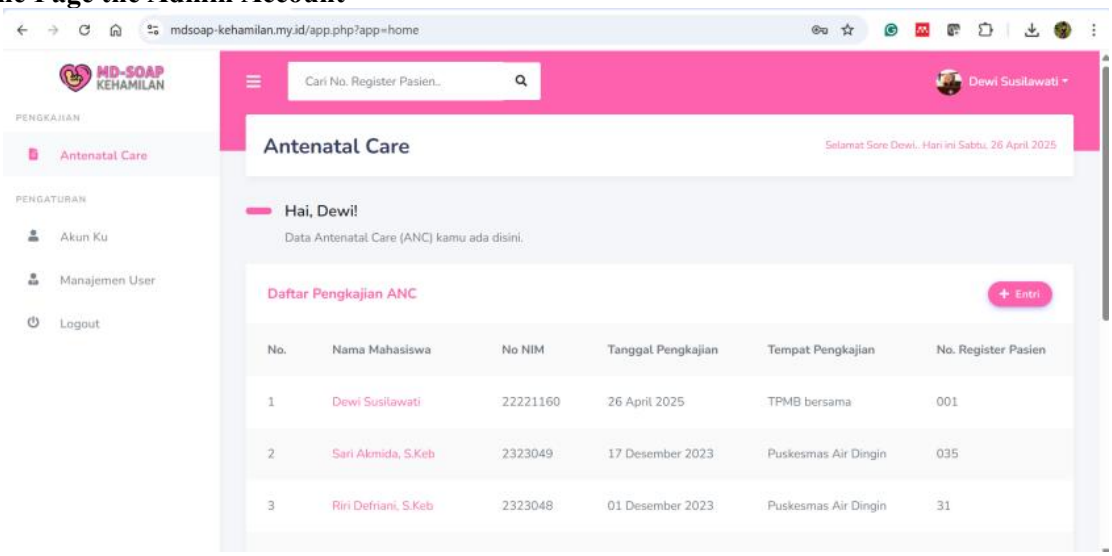


The data filled in by students consists of : Identitas pasien dan suami, Alasan kunjungan, Riwayat The data entered by students consists of: Patient and husband's identity, reason for visit, menstrual history, history of past childbirth, history of contraception, history of current pregnancy, immunization history/screening, maternal health history, family health history, psychological history, socio-cultural history, marital history, daily living habits, preparation for emergencies, physical examination from head to toe, supporting examination, and SOAP documentation. All of these assessments have been tailored to the needs that have been assessed previously for the respondent. https://www.mdsoap-kehamilan.my.id/app.php?app=home&act=view&id=MTgw

Results of the recitation that has been done

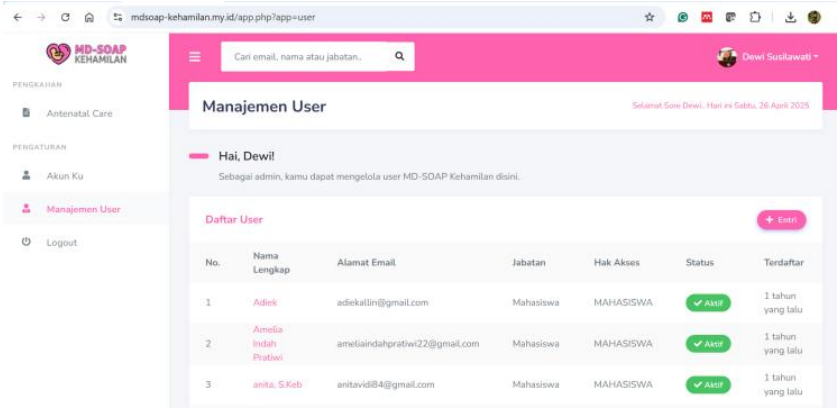
Students can print or update the data needed for patients who have been reviewed. https://www.mdsoap-kehamilan.my.id/app.php?app=ancpdf&id=MTgw

Home Page the Admin Account



Admin can check the assessment activities carried out by students and know how many patients are assessed by students. https://www.mdsoap-kehamilan.my.id/app.php?app=home

User management



On this page, the admin of the year who are active and inactive students. Here, the admin can also deactivate students who are no longer active. The admin can also register student accounts or other admin accounts on this page. https://www.mdsoap-kehamilan.my.id/app.php?app=user

Validation Test Results

Media Expert Validation

Web SOAP of *Midwifery Documentation (MD-SOAP)* was validated by 3 media experts with a Computer Master's background. The results of the validation test can be seen in the following table:

Table 3. Average Results of Material Aspect Assessment by Media Experts

No	Statement	Expert Score			Average Score
		Expert I	Expert II	Expert III	
Presentation					
1	The cover design quality is attractive.	4,00	4,00	3,00	3,67
2	The combination of *background* color and text is clear.	4,00	4,00	4,00	4,00
3	The font size is easy to read.	4,00	4,00	3,00	3,67
4	The shape or typeface is easy to read.	4,00	4,00	4,00	4,00
5	The font size and spacing of the text are harmonious.	3,00	4,00	4,00	3,67
6	The font size and the image match.	3,00	3,00	3,00	3,00
7	The layout of the navigation buttons is appropriate.	4,00	3,00	4,00	3,67
Device Usage					
8	The device can be operated easily	4,00	4,00	4,00	4,00
9	Instructions for Use on the device make it easy to operate	4,00	4,00	4,00	4,00
10	Navigation buttons on the device work as per their function	4,00	4,00	4,00	4,00
Total Score					**37,68**
Average Score					**3,77**

Based on Table 3, the results of validation with media experts obtained an average score of 3.77, which means that it can be categorized as a very feasible criterion. All media experts also stated "this web is suitable for use," but there are parts that need to be improved, namely, the language used must be easy for students to understand, and include a web usage guide for the main page so that students who are new to using it are not confused.

Material Expert

This web validation test is not only given to media experts but also to material experts. The material transfer test was carried out by two midwifery lecturers, namely lecturers who teach pregnancy midwifery care courses. The lecturer validated the content when filling out the pregnancy care documentation. The results of the validation test can be seen in the following table:

Table 4. Average Results of Material Aspect Assessment by Material Experts

No	Statement	Expert Score		Average Score
		Expert I	Expert II	
Penyajian dan kelengkapan Materi				
1	Complete client identity	4,00	4,00	4,00
2	Assessment of complete history data	4,00	3,00	3,50
3	Complete objective data assessment	3.00	4,00	3,50
4	Complete SOAP documentation data entry	4,00	4,00	4,00
Penggunaan Perangkat				
5	The device can be operated easily	4,00	4,00	4,00
6	Instructions for Use on the device make it easy to operate	4,00	4,00	4,00
7	Navigation buttons on the device work as per their function	4,00	4,00	4,00
Total Score				**27**
Average Score				**3,86**

Based on Table 4, the results of validation with material experts obtained an average score of 3.86, which means that it can be categorized as a very feasible criterion. The results of the validation test conducted were that all lecturers also stated "this web is suitable for use" but in the planning section, it should be easier to use because in this planning, not only one care is given, but several cares will be included in the planning.

DISCUSSION

The results showed that all midwifery study program students need midwifery care documentation on a computer or web-based platform for pregnant women because they have been recording midwifery care using handwriting, even though the assessment format has been provided by the study program. The results of the study found many obstacles found by students in recording by hand including taking a long time, tired of writing, complicated, difficult, waste of paper, sometimes writing is difficult to read, sometimes there is wrong writing forced to cross out so that it makes the writing untidy, the risk of loss and damage. These obstacles make students need web-based documentation to make it easier to record and store.

Based on the results of research in developing a midwifery documentation system in web-based pregnancy care, students' expectations that must be on the web are automatic filling of patient data, listing patient assessments so that only fill in patient data, all assessments must be complete, easy to understand, and in Indonesian.

The design of the *midwifery* documentation system in web-based pregnancy care is named SOAP of *Midwifery Documentation (MD-SOAP)* with the web page https://www.mdsoap-kehamilan.my.id/. MD-SOAP is a web-based documentation system designed based on the needs in documenting pregnancy care, starting from a thorough assessment of patient's basic data, diagnosis, care planning, implementation, to evaluation based on the Varney mindset with SOAP documentation, which is written

in narrative. This MD-SOAP web uses the Indonesian language so that it is easily understood by students. The concept of MD-SOAP is to start from filling in student data and client or pregnant woman medical record numbers, assessment data ranging from subjective, objective, to SOAP documentation. The output of this system is a report containing complete pregnant women's data and SOAP pregnancy care documentation. The resulting report is in the form of a PDF which is also equipped with a format sheet for the ratification of the clinical supervisor and academic supervisor.

Research on *SOAP of Midwifery Documentation (MD-SOAP)* is different from previous research because its main focus is to develop a web-based midwifery documentation system specifically for **pregnancy care**, while research conducted by Cut Mutia in 2021, namely the development of documentation named *CMNotes*, focuses more on **childbirth care** (13). MD-SOAP was developed using an R&D approach with ADDIE stages and has passed the validation of media experts and midwifery experts, ensuring that the content of pregnancy care is recorded in full and a SOAP-based narrative. This makes MD-SOAP more structured in terms of pregnancy than CMNotes, which is more common for intrapartum care.

Meanwhile, compared to Erlin Nur Fatma's research in 2023, the fundamental difference lies in the purpose of the system. This application focuses more on **patient service management** in independent practice clinics in general, including queues, service reports, and patient data, without special emphasis on Varney-based obstetric documentation standards or SOAP. (19). Whereas MD-SOAP is designed to support midwifery students in conducting a systematic and educational clinical assessment of pregnancy according to the academic curriculum.

When compared to research conducted by Wahyu Fadjri in 2023, the difference lies in the **development method and target users**. The developed system is more directed to **accelerate hospital clinical assessment services**, with technology that emphasizes the speed and efficiency of hospital patient data input. (11). In contrast, MD-SOAP focuses more on developing student competence in documenting pregnancy care thoroughly, not only accelerating data input, but also educating about the flow of assessment and clinical documentation based on professional standards.

The documentation method that is often used today is in writing. Written documentation has disadvantages such as requiring a long time to fill in the format that has been provided, being easily damaged, being easily lost, requiring a large storage area, and being difficult to find if needed again (10,18,20). Good quality documentation can improve adherence to practice standards, improving patient safety and the timeliness of documentation. (21). A complete documentation process can be relied upon to improve midwifery care. (22–24).

Making web-based documentation based on complete midwifery care guidelines can increase the level of accuracy in conducting better midwifery care assessments so that diagnoses are more precise and the care provided is tailored to the client's needs (9,10,20,25,26). MD-SOAP is a web-based pregnancy care documentation where the assessment has been declared complete, because the assessment format in MD-SOAP is based on pregnancy care, needs analysis conducted by researchers

with students and has been tested to validate the completeness of the study to midwifery experts specializing in pregnancy care, namely 3 lecturers who teach pregnancy midwifery care courses.

The results of other research on web-based documentation have been shown to improve accuracy in documenting to improve nursing care (23,27–29). The accuracy of nursing documentation is very close to the nursing care provided to patients. The use of appropriate and complete nursing care formats can improve nurses' ability to perform documentation (29,30).

Every documentation model has advantages and disadvantages. This web-based pregnancy care documentation named MD-SOAP has advantages in the form of easy access, easy to fill in the assessment, does not need to think about what else needs to be reviewed in conducting the assessment, is not easily damaged, and if needed in the future, can be printed again. MD-SOAP also has a weakness where all the assessments and documentation are on one web page, so it looks long, and what will be filled in. MD-SOAP does not yet have a communication feature for both parties between supervisors and students. In this feature, there is only an admin feature where the admin here can act as a lecturer and the lecturer can only see how much documentation has been made by students. It needs to be developed again so that this website will be perfect. This web has not been tested on students about the effectiveness of using the website.

CONCLUSIONS AND RECOMMENDATIONS

The conclusion in this study is that all midwifery students of STIKes MERCUBAKTIJAYA Padang have been using manual or handwritten pregnancy care documentation. There are so many complaints submitted by students regarding documentation using manual methods. MD-SOAP is the solution to complete and accurate documentation. MD-SOAP has also been validated by media experts and midwifery experts, so that it is suitable for use by students. The suggestion in this study is that MD-SOAP needs to be evaluated for direct use by students so that MD-SOAP can be applied in documenting pregnancy care.

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