



# Health Promotion Media Applications for Midwives About Maternity and Infant Care in Disaster Emergencies

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**Abstract.** Almost all regions in Indonesia are prone to various forms of disasters, both disease and natural disasters. This is because Indonesia is one of the countries in the world located on the ring of fire. The incidence of Covid 19 in the world reached 20 million cases and in Indonesia 130,718 cases with the death of about 5,903 people. Until now, the spread of the virus has not been confirmed. The New Normal policy and the readiness of health workers and the community are of course very necessary so that the policy does not even increase the number of existing cases. In the case of disasters mothers and infants are one of the vulnerable populations who need proactive planning to ensure that their needs are met in the event of a disaster emergency. The purpose: to make a media application for the promotion of maternal and infant midwifery care in disaster emergencies for midwives. The method: The research method used is Research & Development. The research was conducted in the period of April - November 2021 in the practice of independent midwives (PMB) Tasikmalaya City. The research sample used cluster sampling of 20 independent midwives. Questionnaire was used at the stage of design validation and product testing. Result Design Validation Results 4.78 very worthy from Material Experts, Media Validation Results 4.1 worthy from Media expert and Small Group Test Result 4.3 very worthy. Conclusion It is a Worthy application media promotion and can be used with improvements.

**Keywords:** Health Promotion Application · Maternal and Neonatal · Health Crisis

## 1 Introduction

Almost all parts of Indonesia are prone to various forms of natural disasters. This is because Indonesia is one of the countries in the world which is located in the ring of fire (*ring of fire*). Along this path, there are 80 percent or 452 volcanoes of all the volcanoes in the world. About 90 percent of the world's earthquakes occur in the ring of fire. In addition, Indonesia has a mountainous geography and high rainfall in several areas so that many landslides and flash floods occur. (Mediaindonesia.com, February 24, 2018).

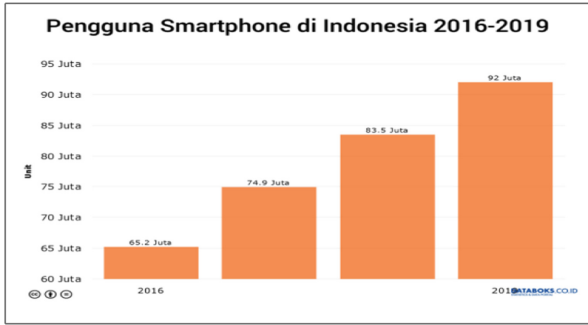
Women of childbearing age are at increased risk during any emergency. Midwives may need to make minor changes to their reproductive health services in response to natural disaster emergency preparedness. Knowledge of preparedness during pregnancy, childbirth and breastfeeding is very important in preparing prospective families to respond to emergency situations in addition to planning for childbirth. There is a lot of relevant information in the current Maternity class that pregnant women need, not only to prepare for birth, but also how to get pregnant, give birth during childbirth in a disaster emergency situation. Preparation informed by the Midwife can make a difference in how many families will be affected during a disaster, especially when they are experiencing pregnancy, birth or postpartum with a baby.

The definition of Emergency Disaster also includes a health disaster in the form of a Pandemic such as the current Corona Virus (COVID 19). The number of cases of Covid 19 in the world has reached 20 million cases and in Indonesia 130,718 cases with deaths of around 5,903 people. Until now the spread of the virus can not be ascertained will end. The New Normal policy and the readiness of health workers and the community are of course very necessary so that the policy does not actually increase the number of existing cases (Worldmater, 2020).

Disasters cannot be prevented, because disasters can come anytime, anywhere and to anyone, even undetected and can take many lives. The community needs to obtain complete information about disaster problems, so that victims can be minimized. This implies that the community needs to know what threats occur as a result of disasters including knowing who are the most vulnerable groups (priority for help). As well as being a priority group to be helped. (Setianingsih, 2019).

Preparedness of health services for mothers and babies during this disaster is very important, where the role of health workers and good active participation of the community can prevent, minimize casualties and accelerate the recovery process from the impact of disasters. (Widyatun, Fatoni, 2018). Health workers, in this case midwives, have an important role in preparing themselves to provide services during the COVID-19 pandemic and natural disasters. The knowledge of the midwife has not previously been exposed to disaster preparedness in lectures, the material obtained is more on development in the workplace under the guidance of the Health Office. With the threat of disaster now, it is necessary to innovate in the form of making information media in the form of applications that can help the process of increasing knowledge while still paying attention to social distancing procedures.

A new report from Emarketer states that there will be two billion active smartphone users worldwide in 2016. And Indonesia is one of the countries with the largest growth, behind China and India. These three countries will collectively add more than 400 million new smartphone users from 2014 to 2018. According to this report, Indonesia will surpass 100 million active smartphone users by 2018, making it the country with the fourth largest smartphone user population in the world (behind China, India, and the United States) quoted from the Tech In Asia website article. Smartphone users in Indonesia spend an average of 140 min per day using their smartphones. The allocation of smartphone usage time is divided into 37 min used for chatting, 27 min for browsing, 23 min for Utility Apps, 17 min for Gaming and 15 min for Multimedia. Then Messaging



**Fig. 1.** Smartphone User Data 2016–2019

8 min, Calls 6 min, and Phone Navigation 3 min. Email, Phone Features, Office Packages and Security each take 1 min per day (DataBox, 2018) (Fig. 1).

Based on the data and phenomena above, it can be concluded that the role of smartphone technology is very useful for the public to access any kind of information, one of which is using Mobile Apps technology, one of which can be used to find information about efforts to prevent health problems, one of which is in the scope of reproductive health. (Yulia & Dede G, 2018).

The Regional Disaster Management Agency for the City of Tasikmalaya noted that 33 of the 39 sub-districts in Tasikmalaya were classified as prone to disasters, both earthquakes and landslides and landslides. 33 sub-districts are classified as prone to landslides, 2 of which are categorized as high potential. Head of Emergency and Logistics (Darlog) Ria Supriatna said two sub-districts that were categorized as prone to landslides were Salawu and Puspahiang. (Mujahideen, 2019). Tasikmalaya City Service Data The number of ODP 1571 and all of them have completed the monitoring period, 34 PDP who have been declared cured. The latest data are 13 cases treated with 1 death. I the latest case from the Cipatujah cluster in a pregnant condition.

From this information, it can be seen that health workers including midwives must have the ability to handle cases of mothers and babies in disaster situations as an effort to adjust services during a pandemic and anticipate natural disaster conditions. Efforts to increase the knowledge and ability of midwives in providing information using online methods are very helpful because of the social distancing policy and the location of midwives and distant targets. Therefore, the author tries to design an information media application for maternal and infant midwifery services in disaster emergencies.

## 2 Research Methods

### Research Stages

The research method used is Research & Development or development research. This development research is in the form of making health promotion media in the form of an android application for PMB (Private Midwifery Clinic) Midwives in providing MCH services on maternal and infant midwifery care in disaster emergencies. This supports

the research roadmap of the Department of Midwifery to focus on quality and superior midwifery care in all service settings, including emergency disaster cases.

1. Research on the preparation of promotional media materials for service readiness in disaster emergencies (year 1)
2. Android application development for the promotion of service readiness in disaster emergencies (year 2)
3. Android application for Midwife targets to expand the scope of product benefits (year 3)

### **Time and Place**

The research will be carried out in the area of the Tasikmalaya City Health Office. Implementation of research in January-November 2021 for stage 1.

### **Research Subject**

The study population was TPMB Midwives in the Tasikmalaya City Health Service area, totaling 261 people until October 2018. The research sample consisted of samples for testing the application of media in the field taken using the cluster method a number of 20 PMB from representatives of the Tasikmalaya City branch. The sample criteria used are PMB Midwives who have an Android smartphone.

### **Development Procedure**

The method used in this development research was adapted from the development procedure according to Sugiyono (2008) which includes: 1) Potential and problem analysis; 2) Gathering information; 3) Product design; 4) Design validation; 5) Design improvements; 6) Product trial; 7) Product revision; 8) Trial of use; 9) Product revision; 10) Mass product manufacture. However, the researchers only adapted several procedures, so that the design of the first-stage android application media about maternal and infant midwifery care in disaster emergencies only included: 1) Gathering information; 2) Product design; 3) Design validation; 4) Design improvements; 5) Product trial; 6) Product revision; 7) Product manufacture.

### **The steps taken are:**

#### **1) Gathering information**

Conduct needs analysis by collecting information about the implementation of maternal and infant midwifery care in disaster emergencies with literature studies and interview techniques that will be carried out in the early stages. Interviews were conducted with Mrs. Ine Hermina, SST, M.Kes, Managers of PD IBI, West Java, Division II. The results of this interview are then used as a basis for preparing the background of the problem and analyzing the needs of the content material for the application.

## 2) **Product Design**

After getting the information, the next step is to design a product in the form of an android application version of the media for midwifery care for mothers and babies in disaster emergencies. Media products are made based on the material in the early stages and are consulted on the information contained in the media as follows: Application Development assisted by 1 application designer, Mr. Fadil Ahmad Djunaedi, MPH. The application used by the programmer is a web view-based Android.

## 3) **Design Validation**

Validation is carried out before conducting product trials in the field. This validation was carried out by an expert, namely the Representative of the Health Office, Head of Primary Services, Tasikmalaya District Health Office HR. Mauludin Muchamad, SKM., M.KM to assess the content/material presented in the application and IT expert Avid Wijaya, S.ST., MKM from Poltekkes Kemenkes Malang for application and validation of application content.

## 4) **Design Improvements**

After the product design is validated by an expert, the weaknesses of the product made will be known, so improvements are made to these weaknesses.

## 5) **Product Trial**

Media that has been tested in the TPMN Midwife in the City of Tasikmalaya area. This trial is intended to see the suitability and effectiveness of the media that has been made in the form of an application. At the end of the trial phase, the PMB Midwives were given a number of questions to determine the effectiveness of using the media to be applied in the field, also given a questionnaire to assess 1) attractiveness, 2) convenience, 3) the usefulness of the product that had been made. The trial sample was carried out in the City of Tasikmalaya. The product test was carried out on 20 PMB Midwives Delima who had an android smartphone.

## **Data Collection and Analysis Techniques**

The data in this development research were obtained through interview techniques and distributing questionnaires to respondents. Interview guidelines were used to analyze needs and obtain information about the implementation of care in conditions of pandemic and natural disasters. For the expert validation test, the promotional media for the android application version was assessed by material experts and IT media experts using a questionnaire about expert responses and input on applications that have been designed to assess product feasibility. Questionnaire sheets are used to collect product assessment data in the implementation of MCH care in disaster emergencies carried out by PMB Midwives in antenatal care regarding the appearance, content of the material and the benefits of the product.

### 3 Results and Discussion

The product produced in this study is a health promotion media in the form of an application design containing material for midwifery services during a health crisis or disaster caused by disease or natural disaster. Product design validation is carried out by media experts and material experts, product design revisions are in accordance with the results of the assessment by media experts and material experts, then product trials in small groups, if there is a revision from a small group, a revision will be made, but if not then followed by trial use in large groups, after which the results were seen whether there was a revision or not. The following are the results of research and development of media applications for health promotion of maternal and infant midwifery care in disaster emergencies at PMB, Tasikmalaya City. That is:

The following is an explanation of each stage carried out in this research and development:

#### 1. Information Gathering Stage

In the early stages, researchers have carried out the stages of research and development, namely the stages of seeing potential problems and analyzing needs, then collecting data by conducting observations and interviews with midwives in basic services. Material input was also from the Management of PD IBI WEST JAVA, Mrs. Ine Hermina regarding the MCH health program during pandemics and natural disasters. The results obtained are the latest references to service policies during the pandemic and MISIP for disasters. After that the team did the product design.

#### 2. Product Planning and Design Stage

Activities carried out at this stage include: making instrument grids and laying out product designs. The finished instrument grid was then developed into a research instrument. The research instruments that will be used are validation sheets and media assessment sheets by PMB midwives.

The validation sheet is used to determine the feasibility of the android application media based on the assessment of material experts and media experts. Material experts provide an assessment based on material aspects which include an assessment of the content, systematics and clarity of the material, the language used, the suitability of the image with the message to be conveyed and the usefulness of the media in antenatal care in the field. Meanwhile, media experts give an assessment based on the efficiency and appearance of the media that has been created and developed. The media assessment sheet by the PMB Midwife was used to find out the responses and responses of the Midwives regarding the Media Application for Health Promotion of Maternal and Infant Midwifery Care in Disaster Emergency at PMB Tasikmalaya City.

The next stage is the manufacture of Android Application media products. The steps taken are; 1) Compile a blue print of the contents of the application in excel, the completed Blue print using a computer. 2) the blue print is then used as a reference for making layouts/menus. The menu is made with attention to aspects of color and composition; 3) The completed menu is then filled with material to be included in the

**Table 1.** Results of Questionnaire Evaluation by Media Experts

Criteria	Average Score	Category
<b>Design/Display Quality (4 items)</b>	<b>4</b>	<b>Worthy</b>
Input, button and output layout	3	
Background selection suitability (Skins)	4	
Appropriate selection of font size and type	5	
Color Match	4	
<b>Button Quality (3 items)</b>	<b>4</b>	<b>Worthy</b>
Pull the button view (button)	3	
Regularity and consistency of button display	4	
Button reaction accuracy (button)	5	
<b>Media Efficiency (3 items)</b>	<b>4.3</b>	<b>Worthy</b>
Ease of use of the program	5	
Ease of choosing the program menu	3	
Ease of entering and exiting the program	5	
<b>Average</b>	<b>4.1</b>	<b>Worthy</b>

application media; and 4) After the step of writing the material, the media is then given an appropriate picture and can illustrate the description of the material. In addition, it is also equipped with instructions for use and explanations of topics listed on the next menu which can be seen by the PMB Midwife.

### 3. Design Validation

In developing audio-visual media products, it is necessary to go through several validation processes and product trials. The validation in this study consisted of the validation of material experts and media experts. This process is carried out so that the product developed is suitable for use as a health promotion medium for PMB midwives.

#### a) Design validation data by Media Expert

This validation data is obtained by providing the application product, accompanied by a questionnaire attachment for the validator. This evaluation is provided by media experts in the form of assessments and suggestions in oral and written form. The aspects validated by media experts are Design/Display Quality, Button Quality and media efficiency. Media expert is Mr. Avid Wijaya, S.ST., MKM from Poltekkes, Ministry of Health, Malang. The following is the final number of data from the results of the evaluation of the questionnaire by media experts, namely: (Table 1).

The results from the table show that the evaluation results of the quality aspect of design/display by media experts have 1 aspect The layout of inputs, buttons, and

**Table 2.** Suggestions and Recommendations of Media Experts

No	Suggestions and Recommendations
1	<i>The menu structure, especially for Member Reference and Icons, is made with not the same buttons as the function buttons in the application, or other names are made, for example the "Credit" link and then the contents of the three buttons in the application. For the main function keys and functions to go to the home page or Back, it is better to distinguish the color. The output page displayed is still in the form of a ppt display which should be adjusted to the consistency of the existing writing in the application.</i>

outputs is still in the quite decent category (3). From the Button Quality category, the attractiveness of the button display is still quite decent (3) and from the Efficiency category, the ease of choosing the program menu item still gets a fairly decent score. Other items on the criteria are eligible and very decent. The final mean score for the three categories of 4.1 on the media is feasible and can be used with minor revisions.

In addition to the above data, media experts provide suggestions and recommendations for improvements made in writing, namely, as follows: (Table 2).

#### b) Result data by Material Expert

This validation data is obtained by providing application media products, accompanied by a questionnaire attachment for the validator. This evaluation is given to material experts in the form of assessments and suggestions in the form of questionnaires.

The material expert assessment process for this application was developed by looking at the results of the media design followed by filling out a questionnaire during the validation process. The media expert validation was carried out by the Representative of the Health Office, Head of Primary Services, Tasikmalaya District Health Office, Mr. HR. Mauludin Muchamad, SKM., M.KM Evaluation by material experts on 11, namely: (Table 3).

The results from the table, show that the results of the evaluation of all aspects by material experts there are 5 aspects that have a Very Worthy value with an average value between > 4.2. Apart from the data from the evaluation of the questionnaire, material experts provide suggestions and recommendations for improvements made in writing, namely: (Table 4).

The conclusion from the assessment given by the material is that it is very suitable for use or testing with the addition of General Prokes material during a pandemic.

## 2. Product Revision

### a) Media Expert Revision

The results of the media revision found that the final average value of the media showed improvements in the value of 3 categories to an average of 4.78. In addition to the data, media experts provided suggestions and recommendations for improvements



**Table 3.** Final Total Average Score of All Aspects of Material Expert

Criteria	Average Score	Category
The suitability of the purpose with the material made	5	Very Worthy
The suitability of the material with the purpose of making media	5	Very Worthy
Material updates	5	Very Worthy
Concept or theory description	4	Worthy
Order (syntax) of presentation of material	4	Worthy
The suitability of the scope of the material with the purpose	4	Worthy
The suitability of the depth of the material with the goal	4	Worthy
Ease of understanding terms	5	Very Worthy
The suitability of the flowchart or illustration with the material	5	Very Worthy
Summary	4	Worthy
Use of spelling and presentation grammar	4	Worthy
<b>Total score</b>	<b>49</b>	
<b>Average Score</b>	<b>4.78</b>	<b>Worthy</b>

**Table 4.** Suggestions and Recommendations of Material Experts

No	Suggestions and Recommendations
1	The material from this application is recommended in the form of a complete guide for midwives including general material for the health care program during the pandemic in providing services to the community both during the pandemic and during the disaster.

that were made in writing, namely, as follows improved menu buttons and differentiating colors.

#### b) **Material Expert Revision**

The results from the table show that the results of the evaluation of all aspects by material experts are in the Good category. Suggestions for improvement from topic material experts are more focused on adding general universal precautions for PROKES 5M during the pandemic for midwives.

### 3. **Product Trial Results in Small Groups**

The results of the trial on a small target group of 20 PMB Midwives are still in the field input process. Those who have entered and can be processed by 5 people with details of temporary results: (Table 5).

**Table 5.** Table of Media Feasibility Test Results by PMB Midwives

Criteria	Average Score	Category
Attractive layout/cover appearance	4	Worthy
Size accuracy	4	Worthy
Large letters can be read clearly	4	Worthy
Information according to service needs	4	Worthy
The content of the information is understandable	4	Worthy
Simple, clear, uncomplicated information	4	Worthy
The information conveyed supports the health program achievement targets	4	Worthy
The information conveyed is interconnected	4	Worthy
The information presented can increase the knowledge and understanding of the Midwife about services during the Pandemic and disaster situations	4	Worthy
Complete information provided	4	Worthy
Submission of information accompanied by related images	4	Worthy
Sequential presentation of information	4	Worthy
The images used are interesting	4	Worthy
The images shown match the information	4	Worthy
The image shown is understandable	4	Worthy
The color display corresponds to the information displayed	4	Worthy
Can be used as an educational aid	5	Very Worthy
Ease of using media as an educational tool	4	Worthy
The language used is understandable	5	Very Worthy
The language used is communicative	4	Worthy
Total score	86	
Average Score	4.3	Very Worthy

**Table 6.** Suggestions and Recommendations of Small Group Respondents

No	Suggestions and Recommendations
1	Barriers found are obstacles in the network, difficulty opening applications and small writing. Suggestions for eye catching writing colors, clarified letters and lettering

Interim Results of the Small group test were 4,321 out of 20 respondents. With the highest score in the application aspect, it can be used as an educational tool and the lowest in the Letter Large category can be read clearly (Table 6).

The conclusion from the assessment given by small group respondents is that the application is good and can be improved in terms of color, writing size.

## 4 Conclusion

Health promotion media in the form of a disaster emergency preparedness application design as a media for health promotion of maternal and infant midwifery care at PMB Tasikmalaya City in 2021 through the stages of potential problems, needs analysis, data collection, product design, design validation, product trial design revision, product revision, trial use and product revision. The feasibility of designing a disaster emergency preparedness application as a medium for health promotion of maternal and infant midwifery care at PMB Tasikmalaya City in 2021 by media experts and material experts, to test the feasibility of conducting a respondent exam to 20 TPMB midwives with very decent media results.

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6. Application Developmen tassisted by 1 application designer, Mr. Fadil Ahmad Djunaedi, MPH
7. Media expert Validator is Mr. Avid Wijaya, S.ST., MKM from Poltekkes Malang Ministry of Health.

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