

# THE INTERNET AS A HEALTH INFORMATION IN DECISION MAKING OF PREGNANT WOMEN

*Internet Sebagai Informasi Kesehatan dalam Pengambilan Keputusan Wanita Hamil*

**\*Nyoman Anita Damayanti<sup>1</sup>, Ratna Dwi Wulandari<sup>1</sup>, Ilham Akhsanu Ridlo<sup>1</sup>, Nadhif Alifa Charista Kusniar<sup>1</sup>, Asrining Pangastuti<sup>1</sup>**

<sup>1</sup>Department of Health Policy and Administration, Faculty of Public Health, Universitas Airlangga, Indonesia

Correspondence\*:

Address: Faculty of Public Health, Universitas Airlangga, Kampus C UNAIR-Mulyorejo, Surabaya, Indonesia | e-mail: nyoman.ad@fkm.unair.ac.id

## Abstract

**Background:** Maternal and Child Health (MCH) is still becoming a health problem in Indonesia. One of the causes of maternal mortality is the speed of decision making in the family. Decision making is influenced by knowledge, awareness, family shape and culture in the neighborhood.

**Aims:** the study aimed to identify and analyze the relationship between the use of the internet as a health information and maternal decision-making regarding emergency help

**Methods:** This study used a mixed-method approach. The sample of 175 respondents. Data analysis performed in this study was frequency analysis, cross tabulation and chi-square.

**Results:** There were 40% of respondents used the internet as a source of pregnancy information. Pregnant women had the information about pregnancy from google, instagram and whatsapp group. There were 45.70% of them have made decisions independently regarding the emergency relief. Chi-square analysis showed a p-value = "0,000" with a contingency coefficient of 0,368 indicating the use of the internet as a health information related to decision making of pregnant women regarding emergency relief.

**Conclusion:** The conclusion of this study is that there were pregnant women who were using the internet for health information and the majority of pregnant women had made decisions regarding emergency relief independently.

**Keywords:** decisions, health information, internet, pregnant women

## Abstrak

**Latar Belakang:** Kesehatan Ibu dan Anak (KIA) masih menjadi masalah kesehatan di Indonesia. Salah satu penyebab kematian maternal adalah cepat atau tidaknya pengambilan keputusan di dalam keluarga. Pengambilan keputusan dilatarbelakangi oleh pengetahuan, kesadaran, bentuk keluarga maupun budaya di lingkungan sekitar.

**Tujuan:** Tujuan penelitian ini adalah mengidentifikasi dan menganalisis hubungan penggunaan internet sebagai sumber informasi kesehatan dengan pengambil keputusan ibu mengenai pertolongan kegawatdaruratan.

**Metode:** Penelitian ini menggunakan pendekatan mix-method. Sampel sebanyak 175 responden. Analisis data yang dilakukan dalam penelitian ini adalah analisis frekuensi, tabulasi silang dan chi-square.

**Hasil:** Sebanyak 40% responden menjadikan internet sebagai informasi kehamilan. Ibu hamil mendapatkan informasi tentang kehamilan dari google, instagram dan grup whatsapp. Sebanyak 45,70% responden telah membuat keputusan secara mandiri mengenai pertolongan kegawatdaruratan. Analisis chi-square menunjukkan hasil p-value=0,000 dengan contingency coefficient 0,368 menunjukkan penggunaan internet sebagai sumber informasi kesehatan berhubungan dengan pengambil keputusan ibu hamil mengenai pertolongan kegawatdaruratan.

**Kesimpulan:** Kesimpulan dari penelitian ini adalah terdapat ibu hamil yang menggunakan internet sebagai informasi kesehatan dan mayoritas ibu hamil telah melakukan pengambilan keputusan mengenai pertolongan kegawatdaruratan secara mandiri.

**Kata kunci:** keputusan, informasi kesehatan, internet, Ibu hamil



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## Introduction

Maternal and Child Health (MCH) is still becoming a health problem in Indonesia. There have been various efforts to reduce Maternal Mortality Rates (MMR) in Indonesia, including improving antenatal services in all health service facilities with good quality and reaching all target groups, increasing childbirth assistance by skilled health professionals, put it at the end of noun clause increasing inaccurate word order for pregnant women and implementing a referral system and improving neonatal services with good quality. The World Health Organization (WHO) pointed out that the maternal mortality rate in the world in 2015 was 216 per 100,000 live births. The maternal mortality rate in Indonesia in 2017 reached 305 per 100,000 live births and reached 91.92 per 100,000 live births in East Java Province (Ministry of Health, 2017). Those numbers still exceed the SDG's target which is under 70 per 100,000 live births.

The occurrence of maternal mortality is motivated by several factors consisting of the health status of pregnant women themselves, utilizing health care and maternal behavior in maintaining their health. The most common causes of maternal mortality in Indonesia are direct obstetric causes including bleeding 28%, preeclampsia / eclampsia 24%, infection 11%, while indirect causes are obstetric trauma 5% and others. Besides those factors, maternal mortality can be caused by the speed of decision making in the family to get emergency help (Arihta T and Kristina, 2018).

Health care decisions often influence the ability to live a healthy life, livelihoods, disability, and death and could also include risky (and often painful) procedures, lifelong medication for chronic disease, major surgery, rehabilitation, and physical treatment (Osamor and Grady, 2016). An initial survey conducted discovered that there were 10 pregnant women who experienced maternal emergencies at Kojja Hospital, Seven of which were mothers who experienced childbirth assistance for their husbands who were slow in making

decisions (Arihta T and Kristina, 2018). Another initial survey conducted showed that in April 2015, there were 20 mothers who experienced obstetric complications and were referred to Sumedang Regional Hospital. They were mothers with the type of decision making in the hands of family and in-laws (Wulandari, Susanti and Mandiri, 2016).

These studies showed that the decision to seek childbirth assistance or other obstetric emergency care could come from the mother herself, her husband, the joint decision made by mother and husband, parents and parents-in-law. In fact, not all pregnant women and families recognized high risk during pregnancy. In addition, decision making was also still influenced by cultural factors or customs. Therefore, it was sometimes too late for them to get to emergency maternal care, to find transportation and to make referral decisions (Ganle *et al.*, 2015). The important role of the health-seeking behavior among women is the power balance between men and women. The women's accession and attainment of healthy and meet household needs at personal, society and public levels can be inhibited by the power relationship. In addition, especially poor women with little or no education, are more likely to be in unequal relationships and to have limited autonomy in accessing maternal care (Nigatu *et al.*, 2014; Rao *et al.*, 2016).

One of an attempt to make effective decision-making for delivery assistance for pregnant women and families is by increasing knowledge and awareness regarding the risks of pregnancy and childbirth. Lack of knowledge about health can have an impact on mortality during pregnancy and childbirth (Damayanti *et al.*, 2019). Knowledge and awareness are not only fostered through formal education, but also obtained through attending associations, accessing the internet and other media such as TV, radio, posters, leaflets to get information directly through health workers.

The use of the Internet has become more and more developed through education and technological processes

(Slomian, *et al.*, 2017). In this modern era, digital technology is developing rapidly which can provide real opportunities to overcome the challenges of the health system (WHO, 2019). One of the health interventions with digital technology is the internet which is the media chosen because it can be accessed anywhere and anytime by pregnant women through smart phones or computers. In addition, many health services and other organizations use social media to deliver health information with a more attractive appearance and create an online group that is useful as a forum to discuss pregnancy knowledge (Sayakhot and Carolan-Olah, 2016).

Based on the afore-mentioned issues, this study focuses on the use of the internet among pregnant women in increasing knowledge and awareness about pregnancy health. The aim of this study is to identify and analyze the association between the use of the internet as a source of health information with the type of mother's decision making regarding emergency help. If the mother has good knowledge and is aware of the importance of maintaining a healthy pregnancy, she will be able to make effective decisions regarding their pregnancy health and the safety of her childbirth. The results of this study can be used as an input or advice in developing awareness and knowledge of pregnant women regarding the health of pregnancy and childbirth safety so that it can reduce the maternal mortality rate.

## Method

This study utilized a mixed-method approach, in which the data collection was done through questionnaires (quantitative) and in-depth interviews (qualitative). The research populations in this article were multiparous pregnant women and mothers of toddlers in 5 Public Health Centers (Puskesmas) in the city of Surabaya representing the capital city and 5 Community Health Centers in Bojonegoro District representing the district area. The city of Surabaya and the district of Bojonegoro are included in the 10 most maternal deaths in East Java. The Public

Health Centers in Surabaya involved in the research were Puskesmas Bulak Banteng, Puskesmas Sememi, Puskesmas Simolawang, Puskesmas Tenggilis and Puskesmas Kedurus, while the Public Health Centers in Bojonegoro District involved in the study were Puskesmas Balen, Puskesmas Ngasem, Puskesmas Padangan, Puskesmas Purwosari and Puskesmas Trucuk. Data was collected from June to August 2019.

Sampling was carried out the formula for estimation of proportion data and produced a sample of 175 respondents. The dependent variable used in this study was the type of decision making by pregnant women. The independent variable used in this study was the use of the internet as a source of health information. Data processing was performed by frequency analysis, cross tabulation and statistical tests with chi-square to determine the association between variables. Two-tailed p-value <0.05 was considered statistically significant.

The purpose of this study is to identify and analyze the relationship between the use of the internet as a source of health information and maternal decision-making regarding emergency help. The results of this study can be used as an input or advice in developing knowledge and awareness of pregnant women regarding the health of pregnancy and childbirth safety so as to reduce the maternal mortality rate.

## Result and Discussion

Maternal health refers to the health of the mother during pregnancy, childbirth, and the puerperium. A healthy mother can avoid complications, death and disability so that she can be more productive and contribute to the welfare of the family and community. On the other hand, mothers who have health problems can cause complications and, the worst possibility, death. To prevent the occurrence of maternal death, a concrete solution is needed to make sure that the mother can be empowered in terms of her health by strengthening information and knowledge

about maternal health adequately. This can help the mother to detect risks and to prevent problems that may be experienced by mother and fetus (Mulauzi and Daka, 2019).

Emergency is a serious and dangerous situation which occurs suddenly and unexpectedly that requires immediate action to save lives. Emergency in pregnancy and childbirth can cause maternal death if it is not immediately handled by skilled health workers (Novvi K, Ermalinda E, 2016). Therefore, it is important to improve the knowledge and awareness of mothers regarding emergencies. Having consultations with health workers to obtain information about pregnancy has limitations, in which mothers usually do not have enough time and energy and need money to access it. It causes mothers to prefer to access the internet either through smartphones and computers to find useful information about pregnancy and childbirth. However, there are also mothers who do not access the internet because they do not have adequate skills or equipment in accessing the internet (Lupton, 2016).

### Univariate Analysis Results

The results showed that there were 70 pregnant women (40.00%) who made the internet a source of pregnancy information. According to the results of in-depth interviews, pregnant women had the information about pregnancy from Google, Instagram and WhatsApp group. Some pregnant women stated that the information accessed was tips about pregnancy,

restrictions during pregnancy, tips on smooth delivery and the dangers that might arise during pregnancy and childbirth and how to overcome them. In addition, some pregnant women who did not use the internet as a source of health information were caused by not having a smartphone and not being able to access the internet (Table 1).

The results showed that most people did not use the internet as a source of information. This finding is in line with the previous African studies examining mothers' perceptions of information regarding dissemination using Information and Communication Technology (ICT). This happens because of the lack of access to internet services in rural areas where the level of ICT infrastructure is far below the urban areas. Therefore, a better Internet connection service is needed to improve the effectiveness of ICT interventions in Nigeria (Obasola and Mabawonku, 2018; Slomian, *et al.*, 2017).

The use of the internet by pregnant women is influenced by information needs, convenience, and speed of access and finding fellow pregnant women with the similar problem. The benefits of using the internet in meeting health information needs can reduce anxiety, get personal support, create emotional connections and increase confidence in pregnant women. The majority of pregnant women usually look for the information using the internet which is done at the early age of pregnancy. The existence of information

Table 1. Univariate Analysis Results

Variables	N	%
The use of the internet as a source of health information		
Yes	70	40,0
No	105	60,0
Decision Maker		
Own decision	80	45,7
Husband	19	10,9
Parents	7	4,0
Parent-in-laws	3	1,7
Joint decision between husband and wife	62	35,4
Others	4	2,3

Source: Primary Data, 2019

about pregnancy on the internet allows mothers to have the confidence to make decisions (Javanmardi *et al.*, 2018). Moon *et al.*, (2019) in their research pointed out that mothers use the internet as a source of health information since it is considered more practical, faster, as a convenient place to get information, specifically non-urgent information, and they do not want to disturb health workers with the number of questions they have.

According to Sanders and Crozier (2018) mothers search for information using the internet due to the power to find sources that support and also challenge their own belief systems to make the right decisions. Apart from the internet including social media forums, other sources of information used are books, magazines, and other visual media. The internet plays a basic role as well as having a positive impact on enhancing mothers' insights. Compared with other sources, the internet is seen as a source of all knowledge by many mothers. Apart from that, the internet offers a wider range. Books and magazines are considered narrow, out of date, and expensive and do not offer accurate information at this time.

Types of decision making by pregnant women can be divided into 6 categories, namely the decision of pregnant women themselves, waiting for husband's decision, waiting for parents' decision, waiting for parents-in-law's decision, the decision between husband and wife and others (medical personnel's decision). The majority of respondents, 80 pregnant women (45.70%), had made independent decisions regarding natural emergency relief. In addition, it was followed by 62 pregnant women (35.40%) who had discussions with their husbands to make decisions about emergency assistance. The results of the in-depth interview indicated that pregnant women who depended on emergency help decisions on parents and in-laws were pregnant women who lived together with parents and in-laws, while pregnant women who determined independently or discuss only with their husbands on the emergency

help, some of which were small families or newly married couples (Table 1).

The results of in-depth interviews in this study also showed that mothers who had the type of decision making 'waiting for parents and in-laws' were mothers who lived in extended families. Therefore, although mothers had accessed various online and offline media to increase their knowledge about pregnancy health, decision making was still done based on their culture or the views of parents and parents-in-law, while the majority of mothers who made decisions independently or only discussed with their husbands were mothers living in nuclear families.

Research in Ghana shows that women with decision-making in health autonomy have a tendency provision of health facilities, which is high compared with those who did not self-sufficient. Other than that, economic factors, educational level, also affect the mother to give birth in health facilities (Ameyaw *et al.*, 2016). In addition, study in rural Sierra Leone found that to control the finances, women were often required to get permission from their husbands before they attend hospital or access certain maternal medical care. (Treacy, Bolkan, and Sagbakken, 2018).

Several factors including elements of problem-solving and informed choice affect decision making in seeking healthcare so requiring a collaborative dynamic until a deal is reached through deliberation and consideration. There are general components of women's autonomy: decision-making over household matters or health care, is controlled over some finances and freedom of movement. Women's ability to maintain their health and use health care services appropriately may depend on their part in decision-making autonomy. This study showed that decision making is mostly done by pregnant women themselves i.e. 45.70%, which is higher compared to a report from Malawi, where 25.9% of women decided independently (Rao *et al.*, 2018). In line with Nigatu *et al.*, (2016) they reported that 43.9% of women were free to access a maternal health facility for their own health care service



needs. Positive association between women autonomy and health care decision-making and better health outcomes (Osamor and Grady, 2016).

There are still many such societies which still have strong social structures that define the roles of men and women rigidly, usually encoded in religious, tribal, and social traditions. When pregnant women face obstetric complications, they should ask permission from their partners or consideration from mother-in-law to undergo treatment in a health facility. Addition, it was reported that husbands were often absent during an obstetric emergency although the majority of husbands provided financial and emotional support for their wives. These barriers often explain the circumstances under which women have or do not have the autonomy to make decisions concerning their own health (Geleto *et al.*, 2018; Osamor and Grady, 2016; Rao *et al.*, 2016).

This is in line with research conducted in Bangladesh by Ghose *et al.*, (2017) which states that the majority of decision-makers in utilizing health services are joint decisions of mothers and husbands. Research in Burkina Faso also found that decision-makers were dominated by husbands and mothers-in-law. The husband has an important role in regulating family income, as the head of the family, and all matters relating to the household must get permission from him. While the mother-in-law is seen as a model for the wife so that in matters relating to women the decision making is often discussed not with a partner but with the mother-in-law (Somé and Sombié, 2013).

## Bivariate Analysis Results

The results showed that pregnant women who utilized the internet as a source of health information had a tendency to be able to make decisions independently regarding emergency assistance as it is shown in Table 2. Bivariate Analysis Results experienced. It was because pregnant women got knowledge and awareness about pregnancy health through the internet, so they were able to make decisions independently, while pregnant women who did not use the internet as a source of health information tended to discuss or rely on decisions for others. Chi square test results showed a p-value of 0.000 or less than  $\alpha$  (0.05) with a contingency coefficient of 0.368. Therefore, it could be concluded that the use of the internet as a source of health information had a relationship with the type of decision making of pregnant women regarding emergency relief. Pregnant women who use the internet mostly make their own decisions (65.7%). While those who do not use the internet mostly make decisions with their husband's (48.6%).

The result showed that the use of the internet as a source of health information has a relationship with the decision makers in accessing health services and pregnant women who use the internet as a source of health information will tend to be independent in making decisions about their health. This is in accordance with a research conducted by Lagan, Sinclair and Kernohan (2011) which found that the internet has an impact or relationship with

Table 2. Bivariate Analysis Results

Variable	Types of Decision Making by Pregnant Women										P-value		
	Own Decision		Waiting for Husband's Decision		Waiting for Parents' Decision		Waiting for Parents' In-Law Decision		Joint Decisions of Husband and Wife			Others	
information	n	%	n	%	n	%	n	%	n	%	n	%	
Yes	46	65,7	5	7,1	4	5,7	1	1,4	11	15,7	3	4,3	0.000
No	34	32,4	14	13,3	3	2,9	2	1,9	51	48,6	1	1	

Source: Primary Data, 2019

the independence of pregnant women in decision making. Pregnant women can seek information and get support from other pregnant women, especially in the first pregnancy. Thus, mothers are more confident in undergoing pregnancy and determine the health services they should take during pregnancy. When mothers have confidence through their knowledge, mothers can make decisions independently, while mothers who are not exposed to information either through the internet or other media will rely on decision-making from other parties because they are less sure of the consequences of the decisions they make in an emergency.

According to Notoatmodjo (2003), the more information obtained can lead to awareness in which someone eventually will behave according to the knowledge he/she has. Therefore, mothers can be empowered in making decisions to immediately access health services and delivery safely. The impact of making the right decision is to prevent delays or being too late in giving the treatment. These delays include: too late to recognize the high risks and dangers of pregnancy and childbirth, too late to make the decision in seeking delivery assistance and handling of complications by health workers in pre-referral and referral services so that emergency cases can be quickly dealt (Path, 2010).

The study has identified pregnant women in Mexico, Italy, China, Turkey, Sweden, United States of America and the United Kingdom who use the internet. It is found that six out of the seven countries have a significant proportion around 80% to over 90% of pregnant women who sought maternal and child health information frequently from the internet. Pregnant women utilize the Internet during pregnancy because they need information. They access the internet as a source of information for seeking additional information about pregnancy to improve their confidence before a prenatal visit or immediately after a visit. Most pregnant women consider the information they found to be reliable and useful. So, they do not need to discuss information they had

retrieved from the Internet with their physicians or midwives. The information was widely accessed by pregnant women on the internet was early pregnancy, fetal development and maternal emergencies. (Sayakhot and Carolan-Olah (2016).

Another study has found that pregnant women are more confident to make better decisions after using the internet. Pregnant women use the internet because it feels easier and the information obtained is considered quite good and reliable. The internet has even become the first source of information related to the health of pregnant women. It does not only provide opportunities for mothers to find and access different information but also becomes an important factor in their choices and decisions (Lynch and Nikolova, 2015).

In addition, the results of this study are also in line with what was stated by Huberty *et al.*, (2013) that knowledge obtained by mothers through the internet will make mothers tend to be more empowered in making decisions regarding delivery assistance independently. Information that can be obtained on the internet in the form of inspection services are available for pregnant women, choices regarding health care facilities, budgeting in delivery preparation and methods of delivery and their consequences. It will make the mother more understand that there are many choices that can be taken so that the delivery process can be done safely and if there is a maternal emergency, the mother has understood the situation and does not panic. Mothers can also share the knowledge they get with those around them, especially their families to make sure that when an emergency occurs, they will be able to make decisions effectively and efficiently.

According to the research of Shorten *et al.*, (2015) the development of health information technology is a new method that can support mothers in making decisions. With the potential benefits of cellular health information technology, paper-based decision aids are transformed into safe and interactive Web sites to meet

the diverse needs of pregnant women and healthcare workers in medical care decisions. Of course, this support tool contains evidence-based information, helps pregnant women weigh the pros and cons of treatment options, and assess benefits and risks according to maternal values and preferences.

Research in Canada mentions the use of the internet, especially mobile applications in accessing information about maternal and child health, presents a great opportunity in making medical decisions. The application can improve access to health services on time during emergencies. In addition, there are public health information services and help manage patient care. The use of a mobile application can make a mother helpless because there is accurate medical information in it. There is a feature to update information automatically so that mothers do not lag behind the latest information on maternal and child health. Another advantage is improving service efficiency, time, cost and connecting in real-time. Patient decisions are made based on joint decisions of medical officers and patients do not need to go to health services because they only need to access the mobile application (Rahimi *et al.*, 2017).

## Conclusion

The conclusion of this study is that there are pregnant women who use the internet as a source of health information and the majority of pregnant women have made decisions regarding emergency relief independently. The results of the cross tabulation show that pregnant women who use the internet as a source of health information have a tendency to make decisions regarding emergency relief independently. In addition, the statistical test results also show that there is a relationship between the use of the internet as a source of health information and decision making regarding emergency relief independently.

## Declarations

## Ethics Approval and Consent Participant

The ethical approval by the faculty of nursing, Airlangga University, no : 1494-KEPK. Respondents were addressed before the survey about the survey's objectives and purposes, and verbal consent to participate in the study was taken from them.

## Conflict of Interest

There is no conflict of interest in this study.

## Availability of Data and Materials

The availability of data and materials based on demand from journals and authors.

## Authors' Contribution

NAD, RDW, IAR, NACK, and AP wrote the original draft.

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