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The Effectiveness and Perception of ICT Program Implementation in Enhancing Maternal and Newborn Survival among Pregnant Women in Indonesian Society

Sofiah[1], Sri Kusumo Habsari[2], and Sumardiyono[3]

[1]Faculty of Social and Political Sciences, UNS
[2]Faculty of Cultural Sciences, UNS
[3]Faculty of Medicine, UNS

Corresponding Author:
Sofiah; email:
sofiarusdiansjah@gmail.com

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Abstract

In an effort to reduce maternal mortality, the Indonesian government launched the Expanding Maternal and Neonatal Survival (EMAS) program. One of its main objectives is to strengthen the referral system that can help in emergency situation and healthcare during pregnancy by using information and communication technology (ICT). It is implemented through such sub-programs as SIJARIEMAS, SIGAPKU, SIPPP, and SMSBunda. Brebes has the highest rate of maternal mortality in Central Java, which is included in the EMAS program. This paper aims to identify the effectiveness of SMSBunda in communicating with pregnant women in Brebes. From focus group discussion with pregnant women, the result showed that SMSBunda has not been taken seriously and people still rely more on their community for information related to their pregnancy.

Keywords: maternal mortality, healthcare, ICT, referral system

1. Background

Ever since the United Nations issue the Millennium Development Goals (MDGs), it has drawn international attention to infant and maternal mortality. Despite the fact that 189 countries have signed the Millennium Declaration, a United Nations progress report from 2008 stated that "maternal mortality [has] remained unacceptably high across much of the developing world, constituting the area of least progress among all MDGs" ([8]: 311). The causes vary from direct obstetric ones (i.e. complications of pregnancy, labor, delivery or the postpartum period) to those of indirect causes (ibid, 312).

Even though the causes of child and maternal mortality are diverse, the efforts being applied are mostly from the healthcare facilities, especially on the training for birth attendants. A study conducted by Hilderbrand informs that global reproductive health policy of the mid-twentieth century was focused on offering training in basic biomedical techniques to traditional birth attendants in regions with high maternal

mortality ratios and infant mortality rates until "skilled birth attendants", or professional midwives, could be placed in government clinics ([4]: 557-558). Ethnographical research on the obstetrical practice of Sumbawan people shows that traditional birth attendants without any professional medical training can contribute to a risk for delivery and thus the skilled birth attendant is needed. This effort does not really succeed, though, especially in rural Indonesia. Local people still trust the traditional birth attendants (*dukunbayi*) as midwives are only believed to be skilledin biomedical practice as opposed to the *dukunbayi* who are regarded as having the skill from the clinic and understanding the community (ibid., 566). Other researchers also found that local people still hold a strong belief that childbirth is not only a healthcare issue but culturally related as well. Not only do the pregnant women seek reassurance from their interactions with obstetrical providers [9], but the people in the community depend upon the traditional birth attendants for assurance of their personal and cultural well-being [1].

While the effort in training to become a skilled-birth attendant does not succeed and even result in the dichotomy of tradition versus modernity, the growth of ICT can be used as a breakthrough communication tool to address child and maternal mortality. Technology starts taking a significant part in everyone's life and there has already been a vast usage of mobile phones in Indonesia, where. most mobile phone users are women. Women are much more likely than men to read news found within social media on their smart phones according to the latest mobile media survey [6]. Oglivy Action (2013) identifies that women appear to be taking the lead when it comes to smartphone technology (ST) phone use, with 56 percent owning a smart phone compared with 51 percent men (ibid 159). Those are good numbers for creating a good chance in combining technology and healthcare to give access for the rural people. Moreover, it is also supported by the expansion and extension of mobile networks that are now available in almost every area ([7]: 40).

Various literatures show that the use of ICT by people in rural area has been applied in many areas. The usage comes in various forms, from the simple text messaging service (SMS) to the launch of smart phone applications. From the research conducted by Nyamawe and Seif, there is a finding that in Tanzania there has already been a program called wired mothers, a project that employs the use of mobile phones to prevent the rise in maternal and neonatal deaths in Zangibar (ibid.). It works by connecting pregnant mother to healthcare facility through standard SMS format. This can reach a vast population ever since SMS standard is very simple and mothers has already got used to it. Moreover, Nyamawe and Seif also have taken Ghana as the example of the use of ICT to assist healthcare facility for pregnant women where they have websites such as www.mamaye.org.gh for any information related to child and maternal care. This is relevant approach since website is considered as powerful

medium in delivering vast amount of information (ibid.). Research from Fotso and Tsui shows that several established applications have also been upgraded to the next level for helping this program just as how Google Earth, which can display the surrounding ecology and terrain, road networks and service infrastructure, help analysts estimate difficulty of travel to eligible points of care (Neelkamal in [3]: 1599). Thus, it has been developed from simple to complex technology.

The involvement of ICT in assessing the healthcare programs not only functions as a server of information with one-way communication as found out by Fotso and Tsui, but it also shows a development into complex communication. One of its projects upon which most papers in this supplement are based, aimed at harnessing the opportunities offered by the rapidly expanding field of mobile health (mHealth) to alleviate some of the barriers that hinder the uptake of health services and healthy behaviors ([3]: 1598-1599). The effort of breaking the barriers also happens to elevate some healthcare levels, which provide the users with needed information. Fotso and Tsui [3] explain that mHealth has five broader groups in which one of them is assessing patients to self-monitor. Patients can upload their organ condition or any disease and drug information which will be transferred to the health consultant via mHealth. This finding is debated by a research conducted by Jayaseelan, Pichaandy, and Rushandramani where they have identified that women with the family income of 10001 to 20000 are using apps more frequently while the others use them less ([6]: 158). It can be drawn that mHealth here is not accessed by low-income users. There is still homework of IT development in order to develop this mHealth app. friendlier to low-income users.

Similar to Ghana and Tanzania, Indonesian stakeholders also have realized the importance of the ICT in reducing child and maternal mortality. Programs for child and maternal healthcare have now included the application of referral systems. This is due to the significant deaths caused by the lateness of bringing the patient to the nearest healthcare facility. Thus, Indonesian government through its Expanding Maternal and Neonatal Survival (EMAS) program initiates the development of referral system that enhances the awareness of emergency situation. It harnesses the mobile phone technology as it is implemented through three programs, which are SIJARIEMAS, SIGAPKU, and SIPPP. SIJARIEMAS is designed for maternal and neonatal care especially for pre-delivery period.

Meanwhile, SIGAPKU is made for managing any criticisms or suggestions for any healthcare facility. SIPPP is created for the improvement of healthcare employee. Lately, EMAS has designed another referral system called SMSBunda. While it has many similarities to SIJARIEMAS (both are made for mothers and children), SMSBunda offers more upgraded service that facilitate pregnant women from the antenatal to postpartum period. SMSBunda does not only target the reduction of the lateness but also mother and child health before and after delivery. SMSBunda provides women

with life-saving information during pregnancy and in the early days after delivery, such as helping women identify the signs that they or their babies may need to visit a health facility (`http://emasindonesia.org/read/menu/2/SMSBunda` last accessed on September 26, 2016 09:27). All pregnant women have only to register their mobile phone number and they will get regular messages about any information in related to their pregnancy. The messages usually revolve around general pregnancy information, several indications that need medical attention, and general healthy tips. SMSBunda is designed with an expectation that it becomes the frontrunner of EMAS program in Indonesia.

The goal of this research is to look at the effectiveness of the program in enhancing maternal and newborn survival and the perception of the program among pregnant women, especially in two socially diverse areas of Brebes which is one of the regencies with the highest maternal mortality number in Indonesia. By observing the effectiveness and society's perception towards the program, this research is meant to look further beyond the ICT aspects that are still less scrutinized by other researchers. This research is trying to reconsider the cultural and social aspects that have long been forgotten when it comes to the discussion of ICT. In the end, the study of technology as part of communication cannot be separated from those two where they work as an influential background in the acceptance of ICT itself.

2. Method

This research was conducted in two socially and culturally different sub-districts, Bulakamba and Sirampog that represent the area with the highest and the lowest maternal mortality number. The primary data were taken through Focus Group Discussion (FGD) with pregnant women from these two sub-districts. Articles, journals, books, websites related to maternal mortality and the development of ICT are used as secondary data. The data were collected and analyzed through a reflective process of data reduction, data display and conclusion drawing and verification [5], to discover the effectiveness of SMSBunda and the perception the respondents to the program in two areas with different social and cultural situation.

3. Findings and Discussion

Eventhough the two sub-districts taken for this research are located in the same regency, the social culture of the two is completely opposite. Sirampog is situated in the mountain slope at 758 m altitude. The majority of the people work as farmer and they are still very communal. They are also very quiet and not opinionated in

any meetings or discussions. Bulakamba is located in northern coastal area of Central Java at only 80 m altitude. Unlike Sirampog, Bulakamba is situated in an area close to the highway of Semarang-Jakarta which makes the people considered have urban and individual characteristics. These make them louder and more expressive in the discussion compared to people in Sirampog.

The difference of the two sub-districts can also be found in their pregnant women. Sirampog has a couple of high-risk-identified pregnant women despite its lowest rate in maternal mortality. Both the cases are caused by underage pregnancy, when a woman is pregnant at the age of 17. Another identified high-risk is also on a respondent with her second pregnancy of her age of 19. Meanwhile, there is only one woman with high-risked pregnancy due to her mature age (38 years old) out of all women that we invited to the FGD in Bulakamba. Most of them are in their ideal age of pregnancy with over 20 years, despite it is their first, second, or third pregnancy.

The geographical differences, which impact on the social and cultural values of the community, do not necessarily affect the perception towards ICTs. Both sub-districts share a similarity regarding mobile phone usage. All pregnant women attended the FGD admitted that they all owned a mobile phone with some of them even had smart phones with an internet access. Most respondents were friendly with social media as mobile networks had also reached both sub-districts. As Bulakamba is in Brebes close to the highway of Semarang-Jakarta, this may be nothing special but a strong mobile network in a mountain slope area in Sirampog shows that this regency is catching up with the modernity. Sirampog motivator of maternal and child wellbeing, admits that there is even a cooperation with one of internet providers to build a free tower in this area. It guarantees the people with strong mobile phone connection and also shows the government's awareness regarding the advantage of ICT.

Regarding the issue of ICT-related healthcare through referral system, Sirampog has shown awareness of SMSBunda. Women have already acknowledged this type of communication that helps them during pregnancy. However, this does not mean maternal health information is clearly communicated to the pregnant women. When they are asked if they have already used the SMSBunda service, all of them shake their head in disagreement. Information then flows through the old fashion ways where women accept it from a monthly meeting or community forums or the motivators that come door to door.

Bulakamba sub-district also shares similarity regarding SMSBunda. Even worse, they do not acknowledge this program at all, although it is still understood due to the exclusion of this sub-district in EMAS program. Bulakamba, especially the Puskesmas 1 which covers 8 villages, is not a part of EMAS program target even though they have the highest MMR in Brebes Regency. However, being an urban society with a

wider access, pregnant women have managed to get themselves their own needed information. From the FGD conducted in Puskemas 1, they have shown a wide knowledge regarding pregnancy. They are very enthusiastic during the discussion, actively asking several questions and sharing pregnancy-related information. Some of them also admit that they already use the internet for gaining information. However, their habit is still pretty similar to the communal society where they still rely a lot more from friends or communicators they meet in community gathering. It shows that in relation to pregnancy, face to face communication to gain information is still their priority.

From those findings above, the mobile phone communication use among Sirampog and Bulakamba people still revolves around social media only. Mobile phone is already accessible but it has not reached the maximum utilization as proposed by EMAS program. They target pregnant women to be literate in using their mobile phones, especially for information access. However, this program does not succeed in Brebes Regency as shown by the tendency of reluctance of the pregnant women to use to medium of gaining information, although they have been friendly with social media. They mostly use their mobile phones for connecting themselves to their friends or relatives only.

The efforts of pregnant women in Sirampog and Bulakamba to gain information mostly come from various community forums. In Sirampog, people trust more in their *bidan*, midwife or maternal health motivator in receiving information regarding their pregnancy. Those two usually become their regular consultants that they trust the most. The information also flows through several community occasions like regular Islamic religious meetings or women's forums. Meanwhile, people in Bulakamba admit that they have regularly attended maternal class in the community healthcare service. When they find out that they are pregnant, they already feel obligated to join the meeting.

Up to this point, each sub-district shows their special characteristics in gaining information. There is an apparent dichotomy of rural and urban society, in this case. Sirampog still relies on its communal tradition. They share the pregnancy-related information through several traditional communication models like door to door counseling, a section in women meetings, and even in paternal meetings. Maternal health communicator also builds a communication network through familial approach. When a woman is pregnant, they approach the husband, parents and in-laws of the pregnant woman and educate them various informations related to pregnancy. They also approach the neighbors to inform them that they have an obligation to accompany her during her pregnancy. While employing traditional communication model, there is a remaining myth to challenge regarding pregnancy in Sirampog society. From the FGD, the women admit that they still believe in a myth such as pregnancy is not something to talk about in public. Thus, the community meeting and familial approach help them understanding

this issue with the closest ones so women will never feel alone again. Meanwhile, Bulakamba's individuality is shown from the women's own willingness to attend a maternal class in their sub-district community healthcare service. They are willing to join for the sake of their own pregnancy health and their own need of information. It is not the community that they seek but more of a reassurance for themselves. Their individual character may as well be influenced by the absence of myth in the society. This results in the pregnant women's behavior where they feel no need to join the community unless it is for their own sake because there is no certain issue that they need to understand with the same member from the neighborhood.

Regardless of the dichotomy above, both cases indicate that direct communication is still more preferable for pregnant women in Brebes. This is due to the frequency of community meeting or women's forums in both sub-districts. Sirampog itself has many regular community meetings and women's forums from a small group to big ones which gather individuals from villages in the sub-districts. From all of these occasions, maternal health motivator always has time allowances for sharing information in it. This continuation creates familiarity among pregnant women and thus sees the motivator as their main source of information. Even though Bulakamba has less community meeting among them, their maternal class routine is still the frontrunner in providing them several information. They feel more comfortable sharing information directly with friends and local midwife. Pregnant women in these two sub-districts prefer building relationship to gaining information. They feel safe when they find the same people with similar issues as them.

The remaining strong role of community as the first source of information for pregnant women here shows the same pattern as shown by [4]. It shows that Indonesians still hold a strong belief that pregnancy is not only a medical matter but also cultural-related one. Thus, they still rely much on them. On the other hand, it gives rise to trust issue towards other people outside their community. The referral system and the utilization of ICT fail here due to their distrust. They do not trust the feedback given by professional workers assisted there because these people do not come from their own community. Local midwife and maternal health motivator are still the ones that they trust because these people do not just understand about pregnancy but also the culture that they live in.

Despite the acknowledgment of distinct culture and geographical condition in the targeted location, this research produces no finding regarding the correlation between those two and the maternal mortality rate. Rural area does not necessarily translate to the high rate of maternal mortality rate and vice versa. Furthermore, those elements do not correlate with the usage of ICT in assisting pregnant women as well. Both sub-districts have the same access to the mobile phone usage and networks in spite of differences of geographical condition with social and cultural issues following it. These

findings show the complex maps of the causes of maternal mortality rate and thus there is a need to understand this issue as a whole picture.

This research, however, still focuses only on the effectiveness of the program and also society's perception of it. The program is still far from being effective and the cultural issues of the society have not been researched in this program seriously. This research has already been able to give a vision on the need of improvement of the program. EMAS program has already been a breakthrough in responding to the changes among society especially the habit regarding the development of ICT. However, this program, including SMSBunda, is national, which is applied similarly from one region to another, without considering the specific characteristics of each area. Local government should acknowledge this problem and later on embrace more specific approach in implementing this EMAS program. All side factors like the cultural and geographical condition of each EMAS program's targeted location need to be considered in mapping out the most suitable method for reducing maternal mortality rate.

The findings, however, still do not cover the issues regarding reduction of maternal mortality itself. The analysis regarding communication strategy with the help of ICT as conducted by this research does not produce a clear picture of the effectiveness of ICT in reducing maternal mortality. With the same mobile phone access, the two sub-districts analyzed in this research have a different rate in maternal mortality. This shows that causes are indeed various and there is a need to conduct a cross study between sociology, cultural studies, and technologies in order to identify the whole picture of these issues. Cross study research will produce a more integrated yet effective approach in reducing maternal mortality because it embraces the complexity of the problems faced by pregnant women.

The failure of SMSBunda in two sub-districts of Brebes Regency show the approach of technology is nothing without understanding the culture of society. As this is included in the national program, the application is similar from one regency to another without further consideration regarding the specificity of each regency. This is actually homework for local government to modify the national program that will fit their own cultural condition so that it can work effectively. The modification should consider all aspects, from medical to cultural. It should pay attention to the details which involve understanding the whole picture of these pregnant women. Pregnancy is a medical issue and thus the medical records, psychological conditions, and indications during pregnancy should become a serious consideration. However, it is also a cultural issue where the habit of the society and geographical condition may affect the maternal and neonatal health. The list is still going on to look at every tiny detail related to the conditions that can affect mothers and children during pregnancy. Thus, local

government has to work creatively to create a program that does not only cover the maternal emergency but also approach a wider context of pregnancy itself.

4. Conclusion

Although the use of ICT in assisting pregnant women has been scientifically proven as a breakthrough in reducing maternal mortality, the utilization of this approach is not necessarily effective in the rural areas. Pregnant women in Sirampog and Bulakamba still trust their community more than the professional workers. Women claim that it is not about the information but more about theperson communicating and delivering the information. The use of community gathering a medium for providing information work more effectively than the ICT in these two sub-districts. This shows that even though the trend in using mobile phones keeps on rising, there is still not many people who employ the system. They are still stacked with the idea of mobile phones for social media and not yet using it to gather information. These pregnant-women are already aware of the benefits of mobile phones in accessing any information related to their pregnancy but this does not go hand in hand with maternal mortality rates that remain high in this regency. The cause for this problem, however, is beyond the focus of this research. It involves some other aspects that need further research to cover the causes of the relatively high rate of maternal mortality in Brebes.

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