Article

Sustainability in transformation of maternal mortality by interaction based approach in Dairi, Indonesia

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Abstract

Background: Health and mortality problems are closely related to the maternal mortality rate (MMR). Efforts to reduce MMR have been carried out by many countries, including the Indonesian government.

Design and Methods: This research was conducted using two approaches, namely quantitative and qualitative or mixed methods and 149 respondents and 26 informants, to reduce MMR in Dairi Regency. This study was also carried out to determine the dominant variable that affects mother's behavior in an effort to reduce MMR in accordance with the existing theory.

Result: Mother's intention to contribute to the reduction of MMR in this study was influenced by the good factor directly or indirectly. This is indicated by the score $p<0.005$. The study also shows that it is very important for the health workers to be able to communicate well with individuals and communities.

Conclusion: The present study will help to reduce maternal fatalities, and will help to build systems and processes that will allow control the behaviour of the pregnant women and determine the cause of death as well as its contributing factors.

Introduction

Health and mortality problems are closely related to the maternal mortality rate (MMR). In addition to being used as a health indicator, measures of maternal mortality are also used as indicators of people's welfare or the quality of human development.[1] This is based on the fact that the change in size is closely related to changes in the social and economic conditions of the community.[2]

Efforts to reduce MMR have been carried out by many countries, including the Indonesian government. This is shown by various international conferences organized such as in Nairobi, Kenya in 1987, the World Summit for Children in New York in 1990, and The International Conference on Population and Development (ICPD) in 1994, Making Pregnancy Safer (MPS), and Millenium Summit in 2000. Initiated by WHO in 1998, the Four Pillars of Safe Motherhood was also organized. At this conference all UN members were committed to a mission set out in the Millennium Development Goals (MDGs) program where the strategy is to reduce three-quarters of maternal mortality by 2015, and continue with the Sustainable Development Goals (SDGs) program which will be achieved by 2030.[3]

Some of the conference programs that have been launched above are in line with the Family Planning program, antenatal care, clean and safe examinations and essential obstetric services, antenatal surveillance or pregnancy examinations which are aimed at preparing the mother both physically and mentally for the future. Both during pregnancy and birth, mothers experience complications in the beginning, so they need to be treated as soon as possible. To combat these complications the EMAS (Expanding Maternal and Neonatal Survival) program and several other programs are coordinated.[4]

In fact, several programs that have been launched are successful in reducing MMR in certain countries. Data obtained from the World Health Organization (WHO) in 2013 showed thatMMR is 210 per 100,000 live births, MMR in developing countries was 230 per 100,000 live births and MMR in developed countries was 16 per 100,000 live births. MMR in East Asia 33 per 100,000 live births, South Asia 190 per 100,000 live births, Southeast Asia 140 per 100,000 live births and West Asia 74 per 100,000 live births.[3]

Based on the results of the 2015 Indonesian Inter-Census Population Survey (SUPAS), it was found that the MMR in Indonesia was 305 per 100,000 live births. The high rate of maternal mortality, in some countries that have not succeeded in reducing MMR, is due to the complexity of the problems and factors

Significance for public health

UNSDG 3 focuses on "Ensure healthy lives and promote well-being for all at all ages" is one of the target by 2030, to reduce the global maternal mortality ratio to less than 70 per 100,000 live births. According to the reports of WHO maternal mortality rate is very high at unacceptable level. About 295,000 women died during pregnancy and also in following pregnancy and childbirth in 2017. The majority of these deaths (94%) occurred in low-resource settings, and most could have been prevented. Women die as a result of complications during and following pregnancy and childbirth. Present study focuses on this important aspect of Global public Health problem. It is seen that motivation to comply, and personal reference had an influence on changes in maternal behavior to reduce MMR in Dairi District, Indonesia. Eleven finding variables were found that affect personal references, namely: local cultural tendencies, interaction strength, kinship strength, rationalization, role of mentors, reinforcing symbols, driving intensity, degree of need, social status/class, interpretation, and expectations.

such as the nutritional status of mothers before and during pregnancy; education and low family economic level; the low status and position of mothers in the family and society, the persistence of various traditional and cultural beliefs that do not support efforts to improve the quality of life of mothers, lack of support from husbands and families, and difficult geographical conditions are also the causes of high MMR which have a severe affect. Another problem is that the coverage of examinations assisted by health workers is not optimal even though the coverage of this service shows an increase, namely 72.37% in 2005 and 88.55% in 2015.[5,6]

The records found from the last three years proved that the target of reduction in MMR in Indonesia was also achieved *i.e.*, from 305 in 2015 to 177 in 2017. However, when compared to Malaysia, Philippines and Singapore, this figure is higher where Malaysia's MMR is 29 per 100,000 live births, Philippines 120 per 100,000 live births and Singapore 6 per 100,000 live births.[3]

Rather than the other causes, the percentage of the root cause of maternal deaths were owing to bleeding 25.24%, infection 14.76%, prolonged labor 13.81%, hypertension in pregnancy 4.29%, abortion 20.95% and others 20.95%.[7]

Armstrong and Kotler[8] stated that several behavioral factors that influence a person's performance are: i) culture, which consists of: culture, sub-culture and social class; ii) social aspect, which consists of: reference group, family, role and status; iii) personal problems, consisting of: age and life cycle, occupation, economic conditions, lifestyle, and self-concept; iv) psychology, which consists of: motivation, perception, learning process, beliefs and attitudes.

Another factor that has an influence on behavior change is the reference factor. Reference is considered important in behavior change in MMR because it has three main reasons, namely to obtain: i) valuable knowledge; ii) reward or avoid punishment; and iii) meaning used to construct, modify or maintain their personal concept.[9] These targets reflect the three types of influence exerted by the reference group, informational, utilitarian and expression values.

Expectations for changes in health behavior for better health of expectant mothers require an appropriate method. Therefore a series of coordination is needed based on a voluntary attitude, awareness and full understanding of shared responsibility. Efforts to treat medically and to improve health facilities alone are not sufficient to reduce MMR if the mother herself does not have good knowledge and awareness and cannot make decisions for herself. The behavior change approach method in the form of increasing knowledge and attitudes about health requires strong intervention from various parties.

Based on Lewin's theory of behavior in 1951 in Azwar,[10] it is stated that behavior change can occur if there is a relationship between the function of individual characteristics and the environment outside the individual. Individual characteristics include various variables such as motives, values, personality traits and attitudes that interact with environmental factors outside the individual. Environmental factors have great power in determining behavior, sometimes even greater power than individual characteristics.There is a relationship between attendance at birth and maternal mortality rates.[11]

The availability of sufficient midwives in all villages to increase the coverage of good birth/delivery assistance as an effort to reduce the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR). In 2015, the number of midwives on duty in Dairi Regency was 400 people, consisting of 234 civil servants and 166 people with PTT status spread across all districts with varying numbers. It has also been reported that despite the existence of a village midwife, the community members decided to use traditional birth attendants and have their babies delivered at home. Traditional birth attendants and village midwives were viewed as crucial, especially in rural areas where health care services were sparse.[12]

In connection with the MMR problem, Dairi Regency is still experiencing problems in decreasing MMR. In 2015, it showed that out of 50,747 productive mothers spread across 15 Districts and 157 Villages and Ward, the MMR was obtained as much as 95 per 100,000 live births. About 20% of pregnant women encountered were classified as high-risk cases of pregnancy hazards or complications requiring referral health services and the percentage of deliveries assisted by health personnel was 79.0%, while other deliveries were still assisted by non-health personnel. When compared with the data from KemenKes,[2] the health personnel with the highest qualifications were midwives (68.6%), then doctors (18.5%), and then non-health workers (11.8%). However, 0.8% of births were carried out without a helper, and only 0.3% of births were assisted by nurses.[11]

Based on the utilization of health service facilities by pregnant women, there are government-owned services (1 hospital for sick, 18 health centers, 122 auxiliary health centers, and 100 poskesdes), while for doctor's practice there are 43 units and clinics/BPS are 57 units.[12,13]

The number and types of health workers and community needs are evenly distributed in each Community Health centers and Poskesdes, as follows: 66 doctors, 400 midwives, 274 nurses, 38 traditional healers and 166 other health workers.[13]

In connection with the above data, it can be explained that there are sufficient health facilities and health personnel capable to serve the population with various health problems in the Dairi Regency area. However, the high MMR is still a problem that has not been able to be resolved until now. The number of reported maternal deaths in North Sumatra Province in 2019 is 202 people with the distribution of maternal deaths 53 people, maternal mortality 62 people and maternal mortality during the puerperium. Age group contributing to the highest number of maternal deaths is the age group of 20-34 years.[14]

In relation to the increase in MMR, some of the main causes are: On an average pregnant woman are giving birth at vulnerable ages (<20 years and >35 years),this reaches 43% of the total reproductive age, namely giving birth to too many children with an average of more than 5 people. About 29% of children, too early or the birth spacing with an average pregnancy interval of 1 year for subsequent pregnancies as much as 69%.[11]

Efforts to reduce MMR is controlled by several factors, both those originating from programs provided by the government and also those factors inseparable from the characteristics inherent to the mother. Some of the characteristics of prospective mothers include income level, where most families are still farming and self-employed, and the level of education of mothers in the low and middle categories.

An article released in 2012 by UNICEF summarizes that child born to less educated mothers generally have a higher mortality rate than those born to highly educated mothers. The infant mortality rate for children of uneducated mothers is 73 per 1,000 live births, while the mortality rate for mothers with secondary and tertiary education is lower at 24 per 1,000 live births.[14]

A series of long- and short-term programs have been implemented at both the primary level and higher health services. Till date, a series of studies related to the reduction of MMR have also been discussed and carried out as an effort to reduce MMR. This decrease in MMR still has not met the expected target.

Materials and Methods

This type of research is analytic observational with cross sectional study design. This research was conducted using two approaches, namely quantitative and qualitative or mixed methods. Mixed Method focuses on collecting, analyzing and mixing quantitative and qualitative data in a single or advanced study.

The study was carried out in three stages and took different locations. The first stage took place at the Sidikalang Hospital Midwifery Polyclinic. The second stage in four locations of community health centers in Dairi Regency, namely: the Batang Beruh Community Health Center, Sidikalang, the Parongil Community Health Center, the Tigalingga Community Health Center, and the Sumbul Community Health Center. In the third stage, the researcher conducted a home visit.

The research was conducted for 10 months starting from October 2017 to August 2018.

Sampling was done purposively, namely mothers who visited the midwifery polyclinic of Sidikalang Hospital, Dairi Regency and met the criteria for the research sample being used as respondents until a sample size of at least 149 people was met. The fulfillment of the sample size during the study was obtained for 4 weeks. The minimum sample size is calculated using the Binomial Proportion Formula, because the population size (N) is known,[15] the formula used is as follows:

$n = N/N(d)2 + 1$

Information:
n=sample
N=population
d=95% precision value or sig.=0.05.

$$n = \frac{237}{237\ (0.05)^2+1} = \frac{237}{1,59} = 149 \text{ individuals}$$

Results

This stages of the study was carried out to determine the dominant variable that affects mother's behavior in an effort to reduce MMR in accordance with the existing theory. From the data collection and analysis, the following results were obtained (Table 1).

Table 1 shows that the majority of mothers are >29 years old as many as 89 people (59.7%), the majority of mothers'education is low as many as 106 people (71.1%) and the majority of mothers' income is ≤IDR 2,000,000 as many as 105 people (70.5%).

Table 2 shows that the majority of attitudes towards behavior are good as many as 96 people (64.4%), the majority of normative beliefs are good as many as 106 people (71.1%), the majority of motivation to comply is good as many as 118 people (79.2%), interpersonal communication the majority is good as many as 128 people (85.9%), situational communication is good as many as 125 people (83.9%), and the majority of good reference is 95 (63.8%).

Table 3 shows that the majority of good intentions to behave as many as 98 people (65.8%).

Mother's intention to contribute to the reduction of MMR in this study was influenced by the good factor directly or indirectly. In addition to maternal characteristics (age, education, income), mother's Intention to Behave in this study also showed the influence of motivation to comply, and reference factors. This is indicated by the score p<0.005. The focus of this research analysis is the determinant of Reference to Mother's Intention to Behave to reduce MMR in Dairi Regency. Departing from the problems in the field, the results of the following research can explain several variables that are correlated with efforts to reduce MMR in Dairi Regency. The personal reference determinants can be determined by taking 149 respondents and 26 informants, to reduce MMR in Dairi Regency.

Discussion

The research facts showed that in the study area demographic

Table 1. Distribution of mother characteristics frequency in Dairi Regency in 2018.

Variable	F	%
Age		
18-29 year	60	40.3
>29 year	89	59.7
Education		
Low (SD, SMP)	106	71.1
High (SMA,D3,S1)	43	28.9
Income		
≤Rp.2.000.000	105	70.5
>Rp.2.000.000	44	29.5
Total	149	100

Table 2. Distribution frequency independent variable (behavioral attitudes, normative beliefs, motivation to comply, interpersonal communication, situational communication, and reference) in Dairi Regency year 2018.

Independent variable	F	%
Behavioral attitudes		
Good	96	64.4
Not good	53	35.6
Normative beliefs		
Good	106	71.1
Not good	43	28.9
Normative beliefs and motivation to comply		
Good	118	79.2
Not good	31	20.8
Interpersonal communication		
Good	128	85.9
Not good	21	14.1
Situational communication		
Good	125	83.9
Not good	24	16.1
Reference		
Good	125	83.9
Not good	24	16.1
Total	149	100

Table 3. Dependent variable frequency distribution (behavioral attitudes) in Dairi Regency in 2018.

Behavioral Attitudes	F	%
Good	98	65.8
Not good	51	34.2
Total	149	100

factors do not have a correlation with the reduction in MMR. As evidence, the factors Age, Education, and Income do not correlate with changes in maternal behavior in an effort to reduce MMR.

Regarding Variables, Age and Education, it turns out the factors unwillingness of mothers reduce MMR behavior. Regarding the income variable, the characteristics of the respondents show that this can be due to the guarantee of delivery costs from Beneficiaries of Health Insurance Contribution Assistance BPJS-PBI.This proves that the reasons for high costs and lack of income are not one of the reasons for not giving birth at a health facility. Other study also described about impact of BPJS-PBI health facility in Indonesia among poor and nearpoor.[16]

Based on the frequency distribution table, it shows that there is a tendency for respondents to have normative belief Good Behavior towards pregnant women Behavioral Attitudes. The results of statistical tests show that there is no influence of normative beliefs on Behavioral Attitudes, this indicates that even though respondents have normative beliefs about Good behavior, they do not always have the Behavioral Attitudes to carry out prenatal care and proper delivery in health facilities. Previous study reveals that the most effective change strategies are the ones that impede performance of established behavior while facilitating formation of new behaviors into habits.[17] Researchers assume that this is caused by the respondent's knowledge factor. Based on the results of demographic data, it shows that the majority of respondents have low education levels. According to Barnes *et al.*[18] knowledge and information factors can influence mother's intention to perform a pregnancy check. Factors that influence the intention of pregnant women are gestational age, social norms, maternal occupation, and maternal experience.

The subjective norm in the theory of planned behavior contains two main aspects. According to Fang *et al.*,[19] the first aspect is the mother's belief in the normative expectations of others, which is concerned with support, received from people or groups that are considered important in their life. The second aspect is the level of motivation so that the person are able to comply with the expectations of other people or groups that are considered important to him. Between these two aspects, there is a factor that most influences the mother's intention to carry out a pregnancy routine, namely the variable desire to imitate. Some factors such as family planning, early care in pregnancy, antenatal care can control the maternal mortality rates along with growth of the baby.[20-22] Previous research also found that there is a negative effect of health expenditure on mortality across all percentiles.[23,24] It was found that the risk of increased maternal mortality for women aged 35 and up was concentrated in a few causes of death, and much of this excess mortality can be avoided.[25,26] In connection with the results of this study, the promotional efforts can be carried out in addition to forming good behavior attitudes. Therefore it is also very important to pay attention to the knowledge factor of pregnant women by carrying out health promotion strategies by empowering health cadres, so that the intentions of the pregnant women can be strengthened by adding more knowledge regarding mother's pregnancy care. Moreover, after pregnancy toddler period is also very important for both mother and child.[27]

There is a tendency for respondents to have good situational communication on Behavioral Attitudes among pregnant women. So it is very important for the health workers to be able to communicate well with individuals and communities. Good clinical medical skills without good communication skills from health professionals are not sufficient to guarantee the success of developing good relationship with midwives or the pregnant women.

Conclusion

To eliminate unnecessary maternal fatalities, countries must build systems and processes that allow them to count every maternal death and determine the cause of death as well as contributing factors. This will aid in determining place and method of availability of treatment, as well as its quality of care that may enhance maternal health. It may be stated that personal references and motivation to comply had an impact on changes in maternal behavior to minimize MMR in the Dairi District. In an effort to reduce MMR in Dairi Regency, the strength of communication has a significant impact on personal reference variables. As a result, health personnel must be able to communicate effectively with individuals and communities. Good clinical medical abilities are insufficient to ensure the success of creating good relationship with midwives or the pregnant women without good communication skills from health professionals.

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