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An Intervention Study on Antenatal Class Plus for the Improvement of Healthy Pregnancy and Safe Childbirth in Gowa Regency, Indonesia

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Abstract: Complication of pregnancy and childbirth becomes the main cause of maternal mortality in the developing countries. The aim of the research was to analyze the influence of Antenatal Class Plus on the improvement of healthy pregnancy and safe childbirth in Gowa Regency by 2015. This research used quasi experiment with randomized pre-test post-test control group design. The sample consisted of 70 respondents. They are Somba Opu Health Center, Pallangga Health Center and Bajeng Health Center. The sample was selected by using purposive sampling method. The data were obtained by using questionnaires and were analyzed by using paired t-test and independent sample t-test. The results of the research indicate that there is an influence of Antenatal Class Plus on the healthy pregnancy (77.1%) and safe childbirth (97.1%). There is a difference of knowledge ($p = 0.000$), attitude ($p = 0.000$) and practice ($p = 0.000$) before and after the intervention of Antenatal Class Plus. Additionally, there is a difference of knowledge ($p = 0.000$), attitude ($p = 0.000$) and practice ($p = 0.000$) between the intervention group and the control group. This means that Antenatal Class Plus is more effective to increase the pregnant mothers' behavior to the improvement of healthy pregnancy and safe childbirth in Gowa 2015.

Key words: Antenatal class plus, healthy pregnancy, safe childbirth

INTRODUCTION

Complication of pregnancy and childbirth becomes the main cause of maternal mortality in the developing countries. Research conducted by Mojekwu and Ibekwe in Asia and Africa showed that 1500 women died due to the pregnancy and the complication of pregnancy every day (Mojekwu and Ibekwe, 2012). This death was caused by hemorrhage (25%), sepsis/infection (15%), eclampsia (12%), unsafe abortion (13%), obstructed (8%) and others such as ectopic pregnancy, embolism and complications related to the anesthetic problems (8%) (Arulita, 2011). Another study conducted in Nigeria, it was found that maternal mortality due to the hypertension/eclampsia reached 12.4%, sepsis 11.9%, abortion complication 9.5%, bleeding 4.8% and others 15.6% (Omo-Aghoja, 2010).

In 2008, the number of maternal deaths has decreased to 121 people or 85.17 per 100,000 live births and it decreased again to 118 people or 78.84 per 100,000 KII. While the mortality data by 2010, it increased again to 121 cases. By 2011, the maternal mortality reached 116 cases (Sudariato, 2010). For Gowa Regency, the number of maternal deaths in 2010 was 12 or 93.4 per 100,000 KII. It increased significantly by 2011, 12 or 92.7 per 100,000 KII. By 2012, there was a significant increase for 19 deaths. Then, it declined 10 or 80.39 per 100,000 KII in the year 2013.

Maternal mortality due to hypertension in pregnancy always happens (accounts for 12% of all causes of maternal death). It forms one from three main causes of maternal death. They are haemorrhage and infection. Based on the estimation, more or less 50,000 women all over the world die every year because of preeclampsia. According to the Health Ministry of Republic of Indonesia in 2004, the maternal mortality due to hypertension in the pregnancy is 14.5-24% (Sudariato, 2010).

The nutritional intake of pregnant mother does affect the baby's growth. This case is in line with the nutritional specific intervention program in the program of the first 1,000 days of life with the pregnant mothers, nursing mothers and children from 0 to 23 months as the targets. The key to create the healthy and intelligent children is in the first 365 days of their life. However, many people are not aware yet of it so that many children in Indonesia are less in the nutritional intake that can block their growth. The results reported from the **State of the World's Mother 2012** showed 170 million children in the world do not get the necessary nutrients in the first 365 days in their life (Nove, 2012).

Current hypotheses found that the high number of maternal mortality due to the level of maternal complication is strongly influenced by the socioeconomic factors, cultural and policy as a prerequisite for the formation of knowledge and information about the healthy pregnancy and childbirth. The fifth phase of Public Health stated that the effective efforts to reduce the maternal and infant mortality is only possible when the social and cultural determinant factors are managed so that it opens opportunities of the pregnant women to increase their

knowledge and then it will further promote understanding, awareness and attitude of pregnant women to utilize the health services. Moving on from the framework above, this Antenatal Plus interventional research tried to improve the chances of a healthy pregnancy and safe childbirth done by the pregnancy care and safe childbirth intervention. Benefits of prenatal education services for vulnerable populations are well documented. Research done by Mohamadirizi *et al.* (2013) stated that among 100 primigravid women who checked up in the health care, Navab Safavi received intervention with the E-learning education methods or booklet education for four weeks (Mohamadirizi *et al.*, 2013). There was no significant difference between the grade point of satisfaction and the awareness on both groups before being intervened. While the significant difference was observed for four weeks after the intervention ($p = 0.004$) (Persad and Mensinger, 2008). Indeed, Persad and Meninger found the relationship between attending pregnant mother class and breast-feeding to 100 pregnant mother in the United States who have low income. The pregnant mothers who attended the class while breast-feeding were 90 and 62% of those who did not attend the class. The high number of maternal morbidity and mortality can be minimized by increasing the healthy pregnancy care and safe childbirth done by skilled person in health. So, it needs to involve the pregnant mothers to attend Antenatal Class to influence the behavior of the pregnant mothers (Persad and Mensinger, 2008). It shows the people about the importance of healthy pregnancy and safe childbirth information. This research aimed to analyze the effect of Antenatal Class Plus to the improvement of knowledge and attitude towards healthy pregnancy and safe childbirth in Gowa by 2015.

MATERIALS AND METHODS

This research used S-O-R Skinner 1983 as the theoretic framework. Research concept development organisms variable in the form of participative training to obtain the closed response consists of knowledge and attitude, as well as the open response such behavior. After having the response, it was expected that there would be a change in maternal behavior of the mother about healthy maintenance and safe childbirth.

Location and research design: This research was carried out in three areas of health centers in Gowa. They are Somba Opu Health Center, Pallangga Health Center, dan Baieng Health Center. This research used quasi-experimental with non randomized pre-test posttest control group design to determine the effect of Antenatal Class Plus on the knowledge, attitude and practice of mother to the healthy pregnancy and safe childbirth.

Population and sample: The population in this research was all pregnant mothers registered and checked up in Somba Opu Health Center and in Pallangga Health Center for 112 and 45 per each health center. The sample were 35 respondents coming from Somba Opu Health Center with 12 respondents and Pallangga Health Center with 23 respondents selected by purposive sampling, where samples were taken adapted from the requirements of research that has been set

in advance.

Method of collecting data: In collecting data, the questionnaires were used to the groups after being treated in which the intervention group was given Antenatal Class Plus by the researchers for 6 months. Collecting data through questionnaires included statements about the characteristics of the respondents, knowledge, attitude and practices of mother on the basic maternity. To know whether the questionnaires used was properly right eligible, it was necessary to test its validity and reliability.

Data analysis: The data were analyzed univariately to see the frequency distribution of the respondents' characteristics and each variable. For bivariate analysis, dependent mean different test was used to analyze the effect of Health Center Standard Counseling towards a healthy pregnancy and safe childbirth.

RESULTS

Characteristics of the respondents: Healthy pregnancy is measured by the indicators of body mass index, upper arm circumference, anemia, urinary protein and hypertension. Safe childbirth is if pregnant mothers are assisted by health workers (maternity nurse, midwife, or doctor) and choose the health facilities as the place to give birth. After attending Antenatal Class Plus, 27 respondents (77.1%) experienced an increase in healthy pregnancies and 34 respondents (97.1%) meet the safe childbirth. In the control group, only 19 respondents (54.3%) meet the healthy pregnancy and there are still 3 respondents (8.6%) do not meet the safe childbirth because two of them give birth with the help of the Shaman. The age group is based on the risk of preeclampsia and eclampsias. The age group of 17-19 years that showed the highest percentage (46.2%) does not meet the healthy pregnancy indicator. While the age group of 36-38 years is most vulnerable to the safe childbirth (16.75%). Low safe childbirth is in parity of 4-6 (10%) because they have experienced giving birth. The higher the level of education, access to the safe childbirth will be getting better. However, another healthy pregnancy is just because of the many determinant factors of complication. Self-employed and civil servant have access to the healthy pregnancy (66.7%) and to the adequate safe childbirth (100%) (Table 1)

Univariant analysis: In the intervention group, it keeps increase in the scores of knowledge from the first pretest to post-test of 6.8. After being given the second intervention when the mother entered to the final trimester, the score increases 3.77. Whereas in the control group received Health Center Standard Counseling, the level of knowledge from the pre-test to the final post-test remains the same (Fig. 1).

Scores attitude of the respondents in the control group have a slight increase from the first pre-test to post-test of 0.32. When the mothers attend the next Health Center Standard Counseling, scores attitude of the mothers increase 0.97 after attending the second post-test. While in the intervention group, from the first pre-test to posttest experienced a significant increase with the total score of 29. After passing

Table 1: Common Characteristics of the Respondents in the Intervention Group and in the Control Group to Increase Healthy Pregnancy and Safe Childbirth in Gowa 2015

Characteristics of the Respondents	Healthy Pregnancy				Safe Childbirth			
	Yes		No		Yes		No	
	n	%	n	%	n	%	n	%
Group								
Intervention	27	77.1	8	22.9	34	97.1	1	2.9
Control	19	54.3	16	54.7	32	91.4	3	8.6
Age Group								
17-19	7	53.8	6	46.2	12	92.3	1	7.7
20-35	35	68.6	16	31.4	49	96.1	2	3.9
36-38	4	66.7	2	33.3	5	83.3	1	16.7
Parity								
1-3	38	63.3	22	36.7	57	95.0	3	5.0
4-6	8	80.0	2	20.0	9	90.0	1	10.0
Level of Education								
Unfinished from Elementary	4	80.0	1	20.0	4	80.0	3	20.0
Graduated from Elementary	10	76.9	3	23.1	10	76.9	7	23.1
Graduated from Secondary	12	57.1	9	42.9	21	100	12	0.0
Graduated from High School	17	65.4	9	34.6	26	100	10	0.0
Graduated from Undergraduated Degree	3	60	2	40.0	5	100	3	0.0
Occupation								
House Wife	42	65.6	22	34.4	60	93.8	4	6.2
Civil Servant	2	66.7	1	33.3	3	100	0	0.0
Self-Employed	2	66.7	1	33.3	3	100	0	0.0

Table 2: Scores of the respondents' Attitude on the Intervention Group and Control Group in the Pre-Test, Post-Test 1 and Post-Test 2 in Gowa 2015

Knowledge Score	Pre-Test	Post-Test 1	Post-Test 2	P-Value
Intervention Group				
n	35	35	35	p = 0.000
Mean	18.77	25.57	29.34	
SD	4.14	2.66	1.08	
SE	0.69	0.45	0.18	
Control Group				
n	35	35	35	p = 0.607
Mean	20.74	20.68	20.51	
SD	3.89	3.98	4.03	
SE	0.66	0.67	0.68	
Attitude Score:				
Intervention Group				
n	35	35	35	p = 0.000
Mean	48.40	77.40	107.80	
SD	1.03	6.75	9.71	
SE	1.75	1.14	1.64	
Control Group				
n	35	35	35	p = 0.437
Mean	54.26	54.57	55.54	
SD	6.68	7.79	11.83	
SE	1.13	1.32	2.00	
Practice Score				
Intervention Group				
n	35	35	35	p = 0.000

Mean	5.54	9.26	9.86	
SD	2.88	0.56	0.42	
SE	0.49	0.95	0.07	
Control Group				
n	35	35	35	p = 0.005
Mean	6.14	7.29	7.17	
SD	2.44	1.78	1.67	
SE	0.41	0.30	0.28	

Scores of the respondents' knowledge are different in the intervention group and in the control group. Statistical test results in the pre-test are obtained with the value $p = 0.44$ ($p > 0.05$) that indicates there are differences in the mean scores of the respondents' knowledge between the intervention group and the control group (Table 3).

There is an increase in the mean score of respondents' attitude to the healthy pregnancy and safe childbirth after attending Antenatal Class Plus in the second pre-test to post-test. Statistical test results obtained value of $p = 0.000$ ($p < 0.05$) indicate that there are significant differences in the mean scores of respondents' attitude in the second pre-test and post-test of amounted to 59.4.

It can be concluded that there is an effect of Antenatal Class Plus to the respondents' attitude about healthy pregnancy and safe childbirth (Table 2). The scores of the respondents' attitude are different in the intervention group and in the control group. Statistical test results in the pre-test are obtained with the value of $p = 0.006$ ($p < 0.05$), which indicate that there are differences in the mean scores of the respondents' attitude between the intervention group and in the control group (Table 3). There is an increase in the mean score of the respondents' practice in implementing the healthy pregnancy and safe childbirth after attending Antenatal Class Plus in the second pre-test to post-test. Statistical test results obtained value of $p = 0.000$ ($p < 0.05$) shows that there are differences in the mean score of the of the respondents' practice in the second pre-test and post test of amounted to 9.86. So, it can be concluded that there is an effect of Antenatal Class Plus on the respondents' practice in the application of healthy pregnancy and safe childbirth (Table 2). Differences exist in the scores of the respondents' practice to the implication of healthy pregnancy and safe childbirth in the intervention group and the control group. Statistical test results in the pre-test are obtained the value of $p = 0.351$ ($p > 0.05$), which indicates that there is no difference in the mean score of the respondents' practice in the upgrading application in the healthy pregnancy and safe childbirth between the intervention group and the control group (Table 3).

DISCUSSION

Antenatal Class Plus is the information given about Antenatal Class with additional information about the support from the husband and family, preparation for childbirth and postpartum and parenting the first 365 days of life through the lecturing method of question and answer with the help of the media used such modules, posters, leaflets, video and props. The materials are given by expert facilitators of obstetrics with two meetings to the pregnant mothers who have attended Antenatal Class Plus.

Results show an increase in the mean scores of the respondents' knowledge about healthy pregnancy and safe childbirth after being given a lesson in Antenatal Class Plus in the second pre-test to post-test. Statistical test results obtained value of $p = 0.000$ ($p < 0.05$) indicate that there are significant differences in the second pre-test and post-test of amounted to 10.57. The conclusion can be drawn that Antenatal Class Plus has an effect to the respondents' knowledge about healthy pregnancy and safe childbirth.

The existing of Antenatal Class Plus is very useful because there are interactions and sharing of experiences among participants (pregnant mother with pregnant mother) either between pregnant mother and the health officers. They are able to convey the problems of their pregnancy experienced without being limited to the level of education that they have because this class is designed nicely based on the local language.

In the control group, based on t-test before and after the Health Center Standard Counseling done to the pregnant mothers, the value is obtained of $p = 0.607$ ($p > 0.05$). It means that there is no influence of the Health Center Standard Counseling Methods to the increase of the respondents' knowledge about healthy pregnancy and safe childbirth. So, it has implications to the birth of four asphyxia babies (5.7%) and three infants dysmaturity babies (4.3%). This is due to the bad condition of the mothers, less care during pregnancy and inadequate neonatal care.

Based on the test results of t-test, the score of the respondents' knowledge between the control group and the group which will get intervention before being given intervention is p-value = 0.44. This shows that there is no difference in the mean score of knowledge between the two groups before the intervention is given. This means that both things can be caused by each group which have not had informative access about adequate healthy pregnancy and safe childbirth. This research is in line with the research conducted by Mohamadirizi *et al.* (2013) that state that giving health education through Antenatal Class can improve the knowledge of the mother significantly (Mohamadirizi *et al.*, 2013).

After the mother attends the Antenatal Class Plus consistently and gets assistance after 12 weeks gestation until postnatal, the mother's knowledge constantly increases of highly positive ($p = 0.00$). It is directly proportional to the output of the pregnant mother practice of KI-KIV which has routine check-ups and feels the benefits. In the control group, it is significant statistically ($p = 0.00$) but the mean is too far exceeded from the intervention group. This is in line with the research done by Memon *et al.* (2015) where the implementation of ANC clinic intervention is together with the

promotional materials of antenatal care, nutrition education, preparation for childbirth and the infant care practices of newborn baby in health System setting in the mountainous region of Pakistan shows to the intervention group that it has a significant impact in the reduction of mortality burden perinatal (Persad and Mensinger, 2008). Significant improvement in antenatal care (92 vs 76%, $p < 0.001$), TT vaccine (67 vs 47%, $p < 0.001$), getting referral (85 vs 71%, $p < 0.001$), the administration of colostrum (83 vs 64%, $p < 0.001$) and early initiation of breast-feeding within one hour after giving birth (55 vs 40%, $p < 0.001$) was seen in the intervention area compared to the area control.

Information about the pregnancy, the husband can help his wife during pregnancy and contribute in controlling the physical and psychological changes of the mother. Based on the statement on the second post-test, there is an increase towards the positive attitude overall (100%). Since the initial examination of the pregnancy, the husband must accompany his wife, attend the class of pregnant mothers, more often to hang out together and the most important thing is not smoke while with his wife. There are 34 respondents (97.1%) who are success in doing Early Initiation of Breast-feeding in the intervention group due to the role of the father. Breast-feeding father is able to make the mother calm and confident in breast-feeding the baby without worry and burden mind after a period of confinement.

The findings show an increase in the mean score of the respondents' attitude to the healthy pregnancy and safe childbirth after attending Antenatal Class Plus in the second pre-test to post-test. Statistical test results obtained value of $p = 0.000$ ($p < 0.05$) shows that there are significant differences in the mean scores of the respondents' attitude in the second pre-test and posttest of amounted to 59.4. So, it can be concluded that Antenatal Class Plus has an effect to the respondents' attitude about healthy pregnancy and safe childbirth.

This is in line with the research done by Olayo *et al.* (2014). He measured the safe childbirth in Kenya for two intervening years (2011 and 2012) to the mothers who had attended a series of training for three-days held three times during the intervention period (Olayo *et al.*, 2014). Differences between the intervention and control groups were statistically significant ($p < 0.001$) for antenatal care, childbirth helped by health facilities, water treatment, the use of latrines, the use of mosquito nets insecticide, attendance of clinic card and measles vaccines. It is the same as the research conducted by Pani *et al.* (2013). They stated that the prenatal class plus counseling increases the mean scores of the pregnant mother's attitude significantly (p -value = $0.000 < 0.005$) (Pani *et al.*, 2013).

The control group in this research uses Health Center Standard Counseling/Lectures method, where this method is one form of the educational methods that present the material through oral narrative and explain it directly to the participants. This method is used to implement the material given expository (Bakkidu, 2008). The findings show to the control group that the mean score of the respondents' attitude to the increase of healthy pregnancy and safe childbirth in the pre-test is 54 when the first post-test increases to 54.57. Furthermore, the mean values of the second post-test increases to 55.54. The lowest scores of attitude in the pre-test is 34 and the highest score is 66. In the first post-test, the lowest score of the respondents' attitude is 34 and the highest score is 74. Then, in the second

post-test, the lowest score of attitude is 34 and the highest score is 111.

In the intervention group, the mean values of pre-test obtain 5.54. After the pregnant mother attends the Antenatal Class Plus, there is an increase in the mean score of the pregnant mother's practice to be 9.85. Results show an increase in the mean score of the respondents' practice in the application of healthy pregnancy and safe childbirth after attending Antenatal Class Plus in the second pre-test to post-test. Statistical test results obtain value of $p = 0.000$ ($p < 0.05$). It shows that there are differences in the mean score of the respondents' practice in the second pre-test and posttest. So that, it can be concluded that there is an effect of Antenatal Class Plus to the respondents' practice in the application of a healthy pregnancy and safe childbirth. Based on the research conducted by Khasanah about the effect of the intervention on family healthy program given toward newborn baby care, it showed that giving intervention significantly can increase the skill of husband in taking care of the newborn baby. By doing health education for the pregnant mother, the improvement of health services and health access will be able to change the behavior of the pregnant mother (Vilkinson and McIntyre, 2012).

Antenatal health counseling for the pregnant mother must meet the essence of teaching and counseling, embedded in the knowledge and the respondents' attitude with non-directive approach (Roter *et al.*, 2006; Pirzadeh, 2007; Meiser *et al.*, 2008). In the context of antenatal counseling, the function of this counseling is called as health education and support in taking decisions (Martin *et al.*, 2013). The third important function is the close relationship between midwives and pregnant mothers, which is considered as the main prerequisite to allow two counseling functions working together (Elwyn, 2004; Smets *et al.*, 2007). Midwives provide the information about the topics such as basic antenatal examination which is needed to make a decision about the routine participation of mother undergoing complete basic antenatal examination (van Agt *et al.*, 2007; Schoonen *et al.*, 2011a, b).

Practically, the mother checks the pregnancy up to know the health of mother and the fetal routinely (K1-K4). The intervention group experienced an increase in the practice while the control group increased. But it is still far from what it is expected. Maternal nutritional status can be known if the mother weighs her body regularly. The intervention group experiences a significant increase in attitude while the control group is still not 100% whereas the mother has been aware that she is already stepping her parity month.

Based on the test results of t-test, the respondents' scores of practices between the control group and the group which will get intervention before being given intervention is p-value ($p = 0.351$). This shows that there is no difference in the mean score of practice between the two groups before the intervention is given. This thing can be caused by some respondents who have not realized of when they get last menstrual period. Besides, each group does not have awareness about the importance of prenatal care. After the mother attends Antenatal Class Plus consistently and get assistance after 12 weeks gestation until postnatal, the mother's knowledge constantly increases of highly positive ($p =$

0.00). It is directly proportional to the output of the pregnant mother practice of K1-K1V which has routine check-ups and feels the benefits. In the **control group**, it is **significant** statistically ($p = 0.00$) but the mean is too far exceeded from the intervention group (Table 4).

This research is in line with the research from Mkandawire (2015). In Malawi, gradient was found in the initiation of the ANC influenced by the education level of the mother. Educated mothers will not delay their first ANC visit. However, after adjusting for the effect of maternal education, it is not statistically significant. Other significant predictors from the age of pregnancy that triggers a mother in Malawi to meet K-I are due to exposure to the media (advertising and video health), the perceived distance from health facilities, age and parity (Mkandawire, 2015).

Decision making is absolutely supported from the midwives to the pregnant mother in making the right choice, for instance discussing various scenarios and putting moral issues in the counseling agenda (van Zwieten, 2008). A good counselor or midwife should establish close relationship with the pregnant mother by showing empathy and support without any conditions out of the decision of the pregnant mothers to join an exhaustive checkup, or reject a pregnancy test, or terminate or continue the pregnancy (Smets *et al.*, 2007). It is suggested to the midwife in Gowa to apply the teaching and counseling, including non-directive approach. Most pregnant mothers in Gowa establish the relationship with their midwife openly undergoing routine checkup and asking about problems in pregnancy and complications experienced

CONCLUSION AND RECOMMENDATION

The results of the research indicate that there is an effect of Antenatal Class Plus on healthy pregnancy (77.1%) and safe childbirth (97.1%). There is a difference of knowledge ($p = 0.000$), attitude ($p = 0.000$) and practice ($p = 0.000$) before and after the intervention of Antenatal Class Plus. Additionally, there is a difference of knowledge ($p = 0.000$), attitude ($p = 0.000$) and practice ($p = 0.000$) between the intervention group and the control group. This means that Antenatal Class Plus is more effective to increase the mothers' behavior for the improvement of healthy pregnancy and save childbirth in Gowa 2015.

It is recommended to the next researcher to modify the maternal health education which is participative so the mother realizes the importance of prenatal care and safe childbirth because the mother can directly consult any changes experienced, either the change of the mother's body or psychological perceived

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