



Knowledge about Nutrition and Testing Gestational Hypertension in Multiple Pregnancies

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Abstract

Background: Hypertensive disorders in pregnancy (HDP) are a leading contributor to maternal, fetal, and newborn death all over the world, including in Indonesia. Routine pregnancy check-ups and nutritional status can prevent pregnancy complications due to HDP.

Objective: To increase health workers' knowledge about the importance of blood pressure check-ups and adequate nutrition during multiple pregnancies.

Methods: The community service activity material was delivered through online seminars with 20 employees and their families at Asri Medical Center Hospital. The inclusion criteria for webinar participants were all employees and their families at the Obstetrics and Gynecology Clinic, AMC Muhammadiyah Hospital, Yogyakarta. The material provided included knowledge about women's health, multiple pregnancies, nutrition for pregnant women, hypertension in pregnancy, and their management. Pretest and posttest were conducted. The analysis method used Wilcoxon Signed Rank test.

Results: It showed a 25% increase in knowledge during the posttest ($p < 0.05$), suggesting a difference in the respondents' knowledge levels about the importance of nutrition and hypertension examination in multiple pregnancies.

Conclusion: There is a significant difference in knowledge about the importance of nutrition and examination of hypertension in multiple pregnancies before and after the seminar at AMC Muhammadiyah Hospital.

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INTRODUCTION

Hypertension in pregnancy is the leading cause of maternal, fetal, and newborn deaths worldwide¹. The incidence of hypertensive disorders in pregnancy increased by 10.92% globally, from 16.30 million in 1990 to 18.08 million in 2019². The number of deaths worldwide due to hypertensive disorders in pregnancy also reached around 27.83 thousand in 2019². In Indonesia, hypertension is the second-highest cause of Maternal Mortality Rate (MMR) after bleeding, with 1,110 deaths in 2020³.

Multiple pregnancies are considered high risk for obstetric complications such as spontaneous abortion, hypertensive disorders, placenta previa, and fetal malformations⁴. Specifically, the incidence of hypertensive disorders, a common source of maternal morbidity, is 15% to 35% in twin pregnancies, which is two to five times higher than in singleton pregnancies⁵. The types of hypertensive disorders in pregnancy include chronic/pre-existing hypertension, gestational hypertension, preeclampsia and eclampsia, and chronic/pre-existing hypertension with superimposed preeclampsia and eclampsia^{6,7}. Chronic hypertension is present before preconception or before 20 weeks of gestation⁸. In comparison, gestational hypertension appears after 20 weeks of gestation⁹.

In chronic hypertension with superimposed preeclampsia and eclampsia, the mother would have had hypertension before and after 20 weeks of gestation with signs and symptoms of preeclampsia or eclampsia⁶. Preeclampsia and eclampsia are conditions where pregnant women develop hypertension after 20 weeks of

gestation accompanied by emergency signs such as proteinuria (abnormal amounts of protein in the urine), kidney dysfunction, liver disorders, uteroplacental dysfunction, as well as neurological or hematological complications⁶. Preeclampsia is a complication of pregnancy that is a relationship between the mother and baby's death⁴. Eclampsia has the greatest likelihood of causing an emergency as it increases the risk of giving birth to a baby with low birth weight by five times, the risk of dying in the womb by six times, and increases the risk of causing maternal death by 12 times¹⁰.

Nutritional status and antenatal care may be associated with gestational hypertension and preeclampsia. A systematic review and meta-analysis study reported that preeclampsia-eclampsia is associated with a high maternal body mass index, chronic hypertension, anemia during pregnancy, and suboptimal antenatal visits¹¹. Thus, fulfilling maternal nutrition and antenatal visits is essential to reduce problems during pregnancy. Therefore, this community service activity was conducted to provide knowledge and raise awareness about the importance of nutrition and examining gestational hypertension in multiple pregnancies during antenatal visits. Multiple pregnancies are three to four times more likely to cause preeclampsia¹².

METHODS

This community service activity involved 20 employees and their families at the Obstetrics and Gynecology Clinic, AMC Muhammadiyah Hospital, Yogyakarta. The invitations to participate in service activities were distributed through letters to the clinic's employees and

their families. Employees and family members who want to join as participants and/or need knowledge about the importance of nutrition and gestational hypertension examination in multiple pregnancies were welcome. The respondents were selected because health workers in this installation, especially mid-wives, often have direct contact with women and handle pregnancy cases. The inclusion criteria for webinar participants were all employees and their families at the Obstetrics and Gynecology Clinic, AMC Muhammadiyah Hospital, Yogyakarta. While the exclusion criteria were employees and their families at the Obstetrics and Gynecology Clinic, AMC Muhammadiyah Hospital, Yogyakarta, they refused to be respondents.

The event was held online through Zoom Meetings for 90 minutes between 14.00 and 15.30 Western Indonesia Time (WIB). The community service activity was conducted

online to adapt to the pandemic as it was impossible to hold social gathering activities¹³. Zoom Meetings application remains the best option for online classes in increasing the knowledge aspect of seminar participants^{13,14}. Figure 1 and Figure 2 below are the material to intervene the participants; nutrition for pregnant women with multiple pregnancies, complications in multiple pregnancies, and hypertension in pregnancy.

Before and after the seminar, the participants filled out the pretest and posttest, respectively. The tests were in the form of Google Form questionnaires to determine the extent of participants' understanding of the importance of nutrition and gestational hypertension examination in multiple pregnancies. The questionnaire consisted of 15 multiple-choice questions and was made by the community service team based on the material presented.

Intervention	First Trimester	Second Trimester	Third Trimester
Maternal weight/weight gain	Assess maternal pregravid BMI, determine BMI-specific weight gain goals	Assess/counsel re: maternal BMI-specific weight gain (each prenatal care visit)	Assess/counsel re: maternal BMI-specific weight gain (each prenatal care visit)
Caloric requirements (kcal·kg ⁻¹ ·d ⁻¹)			
Normal BMI	40-45	Alter as necessary for weight gain goal	Alter as necessary for weight gain goal
Underweight	42-50		
Overweight	30-35		
Micronutrient Supplement (daily total intake)			
MVI with iron (30 mg elemental tablets)	1	2	2
Calcium (mg)	1,500	2,500	2,500
Vitamin D (international units)	1,000	1,000	1,000
Magnesium (mg)	400	800	800
Zinc (mg)	15	30	30
DHA/EPA (mg)	300-500	300-500	300-500
Folic Acid (mg)	1	1	1
Vitamin C/E (mg/ international units)	500-1,000/400	500-1,000/400	500-1,000/400
Nutritional consultation	Yes	Repeat if not at weight gain goal, anemia, GDM	Repeat if not at weight gain goal, anemia, GDM
Laboratory nutritional assessment	Hemoglobin ferritin folate/ B12 early screen for GDM (risk factors) vitamin D	Follow up abnormalities from first trimester	Hemoglobin ferritin GDM screen with or without vitamin D
Risk Factor appropriate exercise or reduction in activity	Screen	Screen	Screen

BMI, body mass index; MVI, multivitamin; DHA, docosahexaenoic acid; EPA, eicosapentaenoic acid; GDM, gestational diabetes mellitus.

Figure 1. Materials of nutrition for pregnant women with multiple pregnancies



Figure 2. Material of Complications in Multiple Pregnancies, and Hypertension in Pregnancy

The questionnaire discussed nutrition concepts in pregnant women, including definitions, benefits, risks of malnutrition, signs or symptoms, and adequate nutrition. Second, they discussed multiple pregnancies, including definitions, risks, complications, and nutritional concepts of multiple pregnancies. Last discussed gestational hypertension, including risks and ways of prevention, and assessed respondents' knowledge about the effect of fulfilling balanced nutrition and examining gestational hypertension during pregnancy on the health of mothers and babies. The questionnaire answers are categorized into yes, maybe, and no. Answers yes, maybe, and no were scored 2, 1, and 0. To check the validity of the questionnaire were re-examined by the speakers (the service team). Moreover, it adjusted to the outcomes expected to be mastered by the participants after attending the online seminar. The results of community service activity were then analyzed using the Wilcoxon Signed Rank test.

Knowledge data were categorized and interpreted in qualitative sentences: good, sufficient, and low. The concept of a standard curve was applied to categorize the findings. The ranges used for the three categories are as follows: $X (m-1.0s) = \text{Low}$, $(m-1.0s) < X$

$(m+1.0s) = \text{Satisfactory}$, and $(m+1.0s) < X = \text{Good}$. The value of s (theoretical standard deviation) was calculated from the range of scores divided by 6. The value of m (theoretical mean) was calculated from (range of scores divided by 2) + the minimum score. The number of items in the knowledge questionnaire is ten, with a score of 0-2. The minimum possible score is $10 \times 0 = 0$, and the maximum is $10 \times 2 = 20$. Thus, the ideal score range is $20 - 0 = 20$. The standard deviation (s) is $20/6 = 3.33$, and the theoretical mean (m) is $(20/2) + 0 = 10$. Based on the theoretical standard deviation and the theoretical mean, the knowledge categories can be described as Low: 6, Satisfactory: 7-13, and Good: >13.

The following are the materials presented during the online seminar:

- Material 1: Understanding multiple pregnancies. The material includes definitions, signs and symptoms, risks, and treatment.
- Material 2: Nutrition for pregnant women. The material includes definitions, benefits, risks of malnutrition, signs, and symptoms of malnutrition and sufficient nutrition, and how to fulfill nutrition in pregnant women.
- Material 3: The importance of checking for hypertension during pregnancy. The mate-

- rial includes the benefits of checking for hypertension during pregnancy, risks, signs and symptoms, and treatment.
- d. Material 4: Handling the risks of hypertension during pregnancy. The material includes primary to referral health services and standard operating procedures for handling hypertension during pregnancy.
 - e. Material 5: Tips and tricks for maintaining health during pregnancy. The material includes nutrition and routine check-ups to prevent hypertension during pregnancy. This research has been approved by the Ethics Commission of the Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta (No. 001/EC-KEPK FKIK UMY/IX/2021).

RESULTS

On Table 1 showed that most of the respondents were 30 years old (75.0%), and one respondent was >41 years old (5.0%). In terms of occupation, most of them were private employees, i.e., ten respondents (50.0%), whereas those who work as midwives and entrepreneurs were five respondents (25.0%). Based on

education, most respondents had a Diploma III level of education at nine respondents (45.0%), and one respondent had a high school level of education (5.0 %).

Table 2 shows that 15 respondents (75.0%), or most respondents, knew about nutrition and gestational hypertension examination in multiple pregnancies in the good category before the seminar. Furthermore, the seminar exhibits that all respondents (100.0%) know about nutrition and gestational hypertension examination in multiple pregnancies in the good category at the end.

Table 3 shows that the data on knowledge about nutrition and gestational hypertension examination in multiple pregnancies before the seminar was not normally distributed, indicated by the p-value of <0.05. The knowledge data about nutrition and gestational hypertension examination in multiple pregnancies after the seminar cannot be tested because all data are the same value. As the research data is not normally distributed, a nonparametric statistical test was used, namely, the Wilcoxon Signed Rank Test¹⁵.

Table 1. Participants' Characteristics

Characteristics		Frequency	%
Age	30 years	15	75.0
	31 – 40 years	4	20.0
	> 41 years old	1	5.0
Work	Midwife	5	25.0
	Self-employed	5	25.0
	Private non-health workers	10	50.0
Education	Senior high school	1	5.0
	Diploma III	9	45.0
	Bachelor	7	35.0
	Master	3	15.0
Total		20	100.0

Table 2. Distribution of Knowledge about Nutrition and Gestational Hypertension Examination in Multiple Pregnancies

Category	Score	Before the Seminar		After the Seminar	
		N	%	N	%
Good	> 13	15	75.0	20	100.0
Satisfactory	7 – 13	5	25.0	0	0.0
Low	6	0	0.0	0	0.0
	Total	20	100.0	20	100.0

Table 3. Summary of the Data Normalization Test Results

Statistics	KS-Z	<i>p</i>	Normal Distribution
Before the seminar	0.194	0.048	No
After the seminar	-	-	No

Table 4. Wilcoxon Signed Rank Test Result

Related Sample Wilcoxon Signed Rank Test	<i>p-value</i>
There is no difference in median on knowledge about nutrition and hypertension examination in multiple pregnancies before and after the seminar	0.001

Table 4 shows that the Wilcoxon Signed Rank test results obtained a *p*-value of <0.05. Thus, H_0 is rejected, meaning there is a significant difference in knowledge about nutrition and gestational hypertension examination in multiple pregnancies before and after the seminar.

DISCUSSION

Pregnancy necessitates a healthy diet rich in energy, protein, vitamins, and minerals to meet the needs of the mother and the baby¹⁶. However, many pregnant women in low and middle-income countries (LMICs), such as Indonesia, experience much nutritional deficiencies¹⁶. Therefore, the community service activity entitled "The Importance of Knowledge about Nutrition and Gestational Hypertension Examination in Multiple Pregnancy" was given to health workers in the AMC Muhammadiyah Hospital, Yogyakarta. Nurses and midwives

are essential in assessing and providing health education about dietary knowledge to pregnant women¹⁷. Thus, it was expected that health workers would educate pregnant women and their families on increasing their knowledge and awareness about the importance of fulfilling nutrition.

The educational characteristics of the participants in this service align with the research results that participants who had undergone college education had significantly more knowledge about pregnancy nutrition ($p < 0.001$)¹⁸. As a result, adequate diet and nutrition during pregnancy and appropriate supplementation are required to provide the energy reserves and pool of macro and micronutrients that enable the countless cell replication and differentiation reactions^{19,22}.

Antenatal screening, done by regularly measuring the mother's blood pressure, is also essential in prenatal care to detect preeclampsia¹⁶. Nutritional assessment and prenatal care by health workers, especially for women with multiple pregnancies, are critical because multiple pregnancies are more likely to cause preeclampsia¹². By improving the nutritional status of pregnant women, health workers can reduce the risk of pregnancy and birth complications^{18,19,20,21,22}.

This community service activity was conducted with the families of employees at the Obstetrics and Gynecology Clinic of AMC Muhammadiyah Hospital to form a protective and promotive behavior at the individual level closest to health workers so that further knowledge and awareness of the fulfillment of the nutritional status of pregnant women and routine antenatal checks can be formed at a higher level. There is a significant difference in knowledge about nutrition and gestational hypertension examination in multiple pregnancies before and after the seminar. Similar results were found in a study of a health education program for nurses in the obstetrics and gynecology department about hypertension in pregnancy, and an increase in participants' knowledge was found²⁰. The seminar provided education about the definition, types, incidence, signs, symptoms, and complications of hypertension in pregnancy in the mother and fetus²³.

CONCLUSION

The results of the event conducted on the importance of knowledge about nutrition and examination of hypertension in multiple pregnancies in the Obstetrics and Gynecology Clinic of AMC Muhammadiyah Hospital

showed that there is a significant difference in knowledge about the importance of nutrition and examination of hypertension in multiple pregnancies before and after the seminar. The limitation of this research is the minimal samples used during the community service activity. Future researchers are expected to use more samples and innovative methods.

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