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EVALUATION INDIVIDUAL LEVEL OUTCOME OF NUTRITION EDUCATION IN SURABAYA PREGNANT WOMEN CLASS PROGRAM

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ABSTRACT

Introduction: Pregnant women class is one of the nutrition education programs and its success can be assessed by its outcomes. **Aims:** to evaluate the outcome of nutrition education in pregnant women class at individual level in Surabaya on 2019. **Method:** This research was a descriptive qualitative study using purposive sampling technique to each informant in 4 public health services (Puskesmas) in Surabaya that is Kedungdoro, Wonokusumo, Siwalankerto and Asemworo. Informants in this study were 2 staff from Family Health and Community Nutrition Section at Health Department of Surabaya, 4 nutrition workers, 7 midwives, 4 pregnant women cadres and 9 pregnant women class participants in 2019. **Result:** show that outcome of nutrition education in pregnant women class program at individual level is mothers' behavior in consuming high iron foods increase during pregnancy, frequency and portions of mother's meals increase during pregnancy and breastfeeding, mother's practice of EIB and exclusive breastfeeding. **Conclusion:** Effect of the nutrition education in pregnant women class on compliance with consuming iron supplementation tablets and PMT biscuit for pregnant women is not yet known and needs to be studied further.

Keywords: mother behavior, nutrition education, pregnant women class

INTRODUCTION

Pregnant women class is a Republic Indonesia Health Ministry program which has been implemented since 2009. This program targets pregnant women who want to learn about health together in a group form (Ministry of Health Republic Indonesia, 2014). Surabaya is the capital city of East Java Province, which has implemented pregnant women classes. Based on pregnant women class program implementation report using maternal and child health (Kesehatan Ibu Anak / KIA) books in Surabaya in 2018, it showed that every village in Surabaya already has a pregnant women class. Although Surabaya has implemented this program in every village, the results of the pregnant women class evaluated in Surabaya are only in the form of output (direct results of the program). Output of the pregnant women class program includes coverage of maternal and child health books, pregnancy examination stickers, pregnancy visits, cross-health assistance, early breastfeeding, and neonatal visits. One goal of pregnant women classes is to increase knowledge and change maternal behavior about preventing nutritional disorders (Ministry of Health Republic Indonesia, 2014). According to Frye and Hemmer, (2012), outcome is short term, medium term, or long term changes as a result of program activities which can be in the form of implementing new knowledge or skills in practice at individual, group, or organizational level. This shows that maternal behavior that supports prevention of nutritional disorders is the outcome of the pregnant women class at individual level that needs to be evaluated to determine the success of nutrition education in the pregnant women class.

Pregnant women class program implementation report using the KIA book shows there are 371 pregnant women classes in Surabaya on 2018, while the number of facilitators available was only

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240 people. These findings indicate that one facilitator can hold more than one pregnant women class. It is feared that there will be nutrition subjects that are not delivered by the facilitator in pregnant women classes, thus affecting the outcome of nutrition education. Because of that reason, we are interested in doing research aimed to evaluate the outcome of nutrition education in pregnant women classes at individual level in Surabaya in 2019.

METHODS

This research was a descriptive qualitative study using purposive sampling technique to each informant in four public health services (Puskesmas) in Surabaya, namely Kedungdoro, Wonokusumo, Siwalankerto and Asemworo. Data collection was performed on May-July 2020 using in-depth interviews and document review techniques. In-depth interview technique was carried out by triangulating sources, which were program maker, program implementer, and program target. Informants in this study were two staff from Family Health and Community Nutrition Section at Health Department of Surabaya, four nutrition workers, seven midwives, four pregnant women cadres and nine pregnant women class participants in 2019. Document review was based on the report of pregnant woman class implementation in four Puskesmas using the KIA book from Health Department of Surabaya in 2019.

Variables studied in this study were nutrition education in pregnant women classes (number of nutrition educator, number of class meetings for pregnant women, delivered nutrition material, and nutrition education facilities), nutrition education obtained by mothers outside pregnant women class program and outcome of nutrition education in pregnant women class program at individual level (mother's diet during pregnancy and breastfeeding, consumption of iron supplementation, consumption of supplementary feeding for pregnant women, early initiation of breastfeeding and exclusive breastfeeding).

Data analysis was carried out by reducing or removing data not related to study, presenting all data related to study, cross-checking or verification between all informant statements with the related document and making a conclusion after obtaining saturated data results. Ethical approval was obtained from the Health Research Ethics Committee, Faculty of Nursing, Airlangga University No 1987-KEPK. Informed consent was given by all informants.

RESULT

Characteristics of Participants' in Pregnant Women Class Program

There were around 70 pregnant women class participants in 2019 in four puskesmas in Surabaya, but only nine mothers were willing to be interviewed. The characteristics of the nine informants participating in the pregnant women class in 2019 are presented in Table 2.

Nutrition Education Outside Pregnant Women Class Program

Six out of nine mothers participating in the pregnant women class in 2019 had received nutrition education outside the pregnant women class. Nutrition education obtained by mothers outside the pregnant women class for six mothers is presented in Table 3.

Nutrition Education in Pregnant Women Class Program

Based on the results of in-depth interview with all informants and review of related documents, the results of nutrition education in pregnant women class at four puskesmas in Surabaya on 2019 are presented in Table 1.

Table 1. Nutrition Education in Pregnant Women Class Program 2019

Variable	Finding
Nutrition Educator	Facilitators (village midwives or implementing midwives)
Number of meeting	3 meetings
Nutritional material presented in	
1st meeting	Recommended foods for pregnant women, high iron content foods, recommendation to consume one extra portion during pregnancy, definition and impact of anemia, recommendation to consume iron supplements, and sign of chronic energy deficiency.
2nd meeting	Definition of early initiation of breastfeeding (EIB), recommendation to provide exclusive breastfeeding, and recommended foods during breastfeeding or postpartum.
3rd meeting	Signs of low birth weight babies, food myths for mothers and babies
Nutrition education facilities	Flipchart for pregnant women class and KIA books.

Table 2. Characteristics of Participant in Pregnant Women Class Program in 2019

Inf code	n children	Age (year)	Gestational age (trimester)	Mother's last education	Jobs	Pregnant women class meetings attended by	
						Mother	Husband
M1	1	32	III	Bachelor	-	Full meeting	-
M2	2	27	III	Bachelor	call center officer	2nd meeting	-
M3	3	27	III	Bachelor	-	1st meeting	-
M4	4	42	III	Senior high school	-	Full meeting	-
M5	2	20	III	Senior high school	online shop seller	1st-2nd meeting	-
M6	3	37	I/II	Senior high school	-	1st-2nd meeting	2nd meeting
M7	2	31	II	Senior high school	-	Full meeting	-
M8	1	25	I	Senior high school	-	1st meeting	-
M9	1	27	I	Senior high school	admin	2nd meeting	-

Table 3. Nutrition Education Obtained by Mothers outside the Pregnant Women Class

Inf code	Sources of nutrition information	Nutrition information that mothers get	Comparison of nutrition information from inside and outside the pregnant women class
M1	KIA book, internet, online group	Foods that are recommended or prohibited for pregnant women	Mother finds it easier to understand nutrition information from pregnant women classes. Reason: Facilitators in pregnant women class used simple language and mothers can have direct discussion with health workers.
M2	Internet	Foods that are recommended for	Mother felt that both nutrition materials from the pregnant women class and from the outside

Inf code	Sources of nutrition information	Nutrition information that mothers get	Comparison of nutrition information from inside and outside the pregnant women class
		pregnant women, EIB	were easy to understand. Reason: Facilitators in pregnant women class used flipchart to explain.
M3	Internet	Foods that are recommended for pregnant women, EIB	Mother finds it easier to understand nutrition information from internet. Reason: Mother unable to concentrate when other participants were noisy.
M5	Internet	Foods that are recommended for pregnant women	Mother finds it easier to understand nutrition information from pregnant women class. Reason: Mother only read nutrition information from the internet briefly so it was difficult to remember
M6	Counseling at Integrated Health Family Post Service (Posyandu)	Foods that are recommended for pregnant women and children under five years	Mother finds it easier to understand nutrition information from pregnant women classes. Reason: Facilitators in pregnant women class used flipchart and KIA book to explain.
M9	Counseling from obstetrician	Foods needed during pregnancy and after giving birth	Mother finds it easier to understand nutrition information from mother's obstetrician. Reason: Mother only attends class for pregnant women once and the nutrition information that she get is about exclusive breastfeeding.

Outcome of Nutrition Education in Pregnant Women Class

The results of interview from nine participants of the pregnant women class program in 2019 found outcome of nutrition education in pregnant women class at individual level as shown in Table 4 (mother's diet), Table 5 (behavior of consuming supplements and supplementary feeding biscuit during pregnancy) and Table 6 (breastfeeding practices).

Mother's Diet during Pregnancy

Table 4 shows that only two mothers (M6, M7) increased food portions during pregnancy because mothers wanted to meet the nutrient requirement of both mother and fetus. M6 attended first and second meetings of the pregnant women class and received information about diet for pregnant women during counseling at posyandu. M7 attended all class meetings for pregnant women and never received nutrition information outside pregnant women class. However, M6 found it easier to understand the nutrition material from pregnant women class. This indicates that the presence of mothers in the pregnant women class can affect the knowledge and awareness of mothers to consume more portions during pregnancy.

Table 6 also shows the portion and frequency of meals of seven other mothers (excluding M6 and M7) during pregnancy depending on their physiological conditions. Mothers who often feel hungry tend to have an increased frequency or portion of their meals while mothers who feel nausea and vomiting tend to have fewer meals and increased fruit portions and frequency. Mothers who didn't feel easily hungry, nausea or vomiting didn't

change their diet during pregnancy, such as M9.

There were only two mothers (M1, M6) who often consumed heme iron food sources during pregnancy. Table 2 and Table 3 show that M1 attended all meetings while M6 attended the first and second meetings of the pregnant women class. They had received information about nutrition for pregnant women nutrition information outside the pregnant women class and both found it easier to understand information from the pregnant women class. This indicates that the presence of mothers in the pregnant women class can affect the knowledge and awareness of mothers to consume iron source foods during pregnancy. Table 4 also shows that seven out of nine mothers (77.8%) have consumed additional food, which is one glass of milk every day during pregnancy.

Table 4. Mother's Diet during Pregnancy and after Giving Birth

Inf code	Mother's Diet	
	During Pregnancy	**After Giving Birth**
M1	1. Portion and frequency of rice increase while portion and frequency of side dishes, vegetables and fruits also had increase. 2. Consume 1 glass of milk/day and 1 chicken liver 1-4 times/month.	1. Portion and frequency of rice increase. 2. Frequency of side dishes and vegetables increase
M2	1. Portions of side dishes, vegetables and rice reduce while portion and frequency of fruits increase. 2. Consume 1 glass of milk/day.	Portion and frequency of meals increase.
M3	1. Portion and frequency of meals didn't change. 2. Consume 2 glasses of milk/day.	1. Portion of meals increase. 2. Consuming 1 cup of turmeric herbs/day.
M4	1. Portion and frequency of meals didn't change. 2. Consume 0-1 glasses of milk / day.	Portion and frequency of meals didn't change.
M5	1. Frequency of rice, side dishes, vegetables increases and eating a variety of vegetables. 2. Consume 1-2 glasses of milk / day.	Frequency and portion of meals increases.
M6	1. Portions of meals increase. 2. Consume 1-2 glasses of milk/day and often eat green vegetables, fish, liver, eggs in the early trimester.	Frequency and portion of meals increase.
M7	Portions of side dishes, vegetables and rice increase.	Portion of meals increase during 3 months of breastfeeding.
M8	1. Portion and frequency of meals didn't change. 2. Consume 1 glass of milk / day.	Portion and frequency of meals did not change.
M9	Portion and frequency of meals didn't change.	Portions of side dishes and rice increase.

Mother's Diet During Breastfeeding.

Table 4 shows only two (M5, M6) out of nine mothers whose frequency and portion of food increased during breastfeeding because mothers wanted to fulfill the intake of both mother and baby. Table 2 and Table 3 show that M5 attended first and second meeting of the pregnant women class and never received nutrition information about breastfeeding mother diet outside pregnant women class. M6

attended the first and second meetings of pregnant women class and she never received nutrition information about breastfeeding mothers' diet outside pregnant women class. This indicates that the presence of mothers in a pregnant women class can affect the knowledge and awareness of mothers to consume with greater frequency and more portions of foods during breastfeeding.

Table 4 also shows the portion and frequency of meals for six mothers (excluding M5, M6, M9) during pregnancy depending on physiological conditions experienced by mothers at that time. Breastfeeding mothers who often felt thirsty or hungry mostly have an increased frequency or portion of meals (rice, side dishes, and vegetables). Mothers who do not easily get hungry or thirsty mostly have an unchanging diet, as experienced by M4 when breastfeeding. This shows that the frequency and portion of mother's meal while breastfeeding is not only influenced by mother's knowledge of nutrition obtained from pregnant women class, but also influenced b physiological conditions experienced by mother.

Only one (M3) out of nine mothers consumed additional food in the form of one cup of turmeric herbs every day during breastfeeding because the mother believed that herbal medicine could help increase breastmilk production. M3 only attended the first pregnant women class meeting. Information about recommended food during breastfeeding is taught by the facilitator in the second pregnant women class meeting. This shows that the type of food consumed by mothers while breastfeeding is influenced by mother's knowledge of nutrition obtained from the pregnant women class as well as cultural factors or local beliefs.

Mother's Behavior in Iron Supplementation Tablet (TTD)

Table 5 shows that eight out of nine mothers received TTD. Five out of eight mothers who received TTD (62.5%) consumed all TTD, where four mothers (M2, M5, M6, M8) consumed all TTD that they received because they followed the recommendations of health workers, and one mother (M1) consumed all TTD because she wanted to maintain her health. Table 2 shows that from five mothers, only M1 attended all meetings of the pregnant women class. Table 1 shows that midwives explained the definitions and symptoms of anemia and recommended that pregnant women take iron tablets during pregnancy at the first meeting of the pregnant women class. During examination or Antenatal Care (ANC), midwives and nutritionists also advised mothers to consume a minimum 90 tablets of TTD during pregnancy. This shows that the effect of the presence of mothers in the pregnant women class on maternal compliance in consuming blood supplemented tablets still needs to be further reviewed.

Three (M3, M7, M9) out of eight mothers didn't eat all TTD that they received. M7 and M9 didn't eat all TTD because they did not like the taste of TTD and routinely took other supplements during pregnancy. This indicates that, in addition to maternal knowledge, maternal preferences also affect TTD consumption. On the other hand, M3 didn't eat all TTD because of nausea and only consumed TTD when reminded by her husband. This shows that family support, especially husbands, plays an important role in mother compliance in consuming TTD.

Mother's behavior in consuming PMT biscuits

In the first meeting of pregnant women class, the midwife explained the signs of CED and recommended pregnant women with CED to consume PMT biscuits. Table 5 shows that one mother (M5) who participated in the pregnant women class (11.1%) had CED. She and two other mothers (M4 and M6) also received PMT biscuits (33.3%). M4 ate all

PMT biscuits because she likes snacks. M5 because they both like snacks. Different from M6, she ate all PMT biscuits alone because she likes the taste of biscuits and wants to maintain the health of her fetus. During the examination or ANC, midwives and nutritionists also provided ate all PMT biscuits with her children and recommended that CED pregnant women eat all the PMT biscuits that were given. This shows that the effect of the presence of mothers in the pregnant women class in consuming PMT still needs to be further reviewed.

Table 5. Mother's Behavior in Consuming Iron Supplementation Tablet and Supplementary Feeding Biscuits During Pregnancy

Inf code	Mother Behavior's in Consuming	
	Iron Supplementation Tablet (TTD)	**Supplementary Feeding Biscuit (PMT Biscuits)**
M1	Mother consumed all TTD. Reason: Mother wants to take care of her health during pregnancy.	Mother didn't have CED and never got PMT biscuits.
M2	Mother consumed all TTD. Reason: Mother wants to follow advice from health workers.	Mother didn't have CED and never got PMT biscuits.
M3	Mother didn't consume all TTD and only consume TTD when her husband reminds her. Reason: Mother felt nauseous after consuming TTD.	Mother didn't have CED and never got PMT biscuits.
M4	Mother never got and consumed TTD. Reason: Mother didn't feel need to consume TTD because do have anemia.	Mother didn't have CED and received 1 pack of PMT biscuits during pregnancy. She consumed all PMT that she got.
M5	Mother consumed all TTD. Reason: Mother wants to follow advice from health workers and wants to get rid the symptoms of anemia.	Mother had CED and only received 1 box of PMT biscuits during pregnancy because she was late asking for PMT. She and her children ate 1 pack PMT biscuit/day.
M6	Mother consumed all TTD. Reason: Mother wants to follow advice from health workers.	Mother didn't have CED, received 1 box of PMT biscuits / month during pregnancy. She ate 7 packs of PMT biscuits/ 10 days.
M7	Mother didn't consume all TTD. Reason: Mother didn't like the taste of TTD.	Mother didn't have CED and never got PMT biscuits.
M8	Mother consumed all TTD. Reason: Mother wants to follow advice from health workers.	Mother didn't have CED and never got PMT biscuits.
M9	Mother didn't consume all TTD. Reason: Mother didn't like TTD.	Mother didn't have CED and never got PMT biscuits.

Table 6. Mother Behavior Related to Breastfeeding Practices

Inf code	Mother's Behavior in	
	Early Initiation of Breastfeeding(EIB)	**Provide Exclusive Breastfeeding**
M1	Mother performs EIB. Reason: Birth attendants direct mother to perform EIB. Process: 5-10 minutes, skin of mother and baby attached, baby assisted in finding mother's nipple.	Mother gave exclusive breastfeeding to baby. Reason: mother thinks that nutrition of breast milk better than formula milk.
M2	Mother performs EIB. Reason: Birth attendants direct mother to perform EIB. Process: Skin of mother and baby attached, baby assisted in finding mother's nipple.	Mother gave exclusive breastfeeding to baby. Reason: Mother thinks that nutrition of breast milk better than formula milk and gets time off from work after giving birth so she can breastfeed directly.
M3	Mother performs EIB. Reason: Birth attendants direct mother to perform EIB. Process: 30 minutes, skin of mother and baby attached, baby assisted in finding mother's nipple.	Mother gave exclusive breastfeeding to baby. Reason: Mother thinks that nutrition of breast milk is better than formula milk.
M4	Mother didn't perform EIB to baby. Reason: Mothers were separated from their baby by birth attendants after delivery process.	Mother's baby has received formula milk before 6 months of age. Reason: Husband never got education about breastfeeding and he agrees with birth attendant to give formula milk to baby.
M5	Mother performs EIB. Reason: Birth attendants direct mother to perform EIB. Process: 15 minutes, skin of mother and baby attached, baby find mother's nipple without assistance.	Mother's baby has received formula milk before 6 months of age. Reason: Baby given formula milk by hospital staff when her 3-day-old baby was hospitalized.
M6	Mother performs EIB. Reason: Birth attendants direct mother to perform EIB. EIB process: 10 minutes, skin of mother and baby attached, baby assisted in finding mother's nipple.	Mother gave exclusive breastfeeding to her baby. Reason: Mother felt that she always able to give breast milk because she didn't work, got support from her husband, and want to fulfill the recommendations of health workers.
M7	Mother performs EIB. Reason: Mother wants to teach her baby to breastfeed. Process: 5-10 minutes, skin of mother and baby attached, baby assisted in finding mother's nipple.	Mother only gives breast milk to baby until 3 months. Reason: Mother cannot produce breast milk after 3 months of breastfeeding her baby.
M8	Mother performs EIB. Reason: Mother wants to form bond with baby and birth attendants' direct mother to perform EIB. Process: Skin of mother and baby attached, baby assisted in finding mother's nipple	Mother gives formula milk to her baby. Reason: Mother cannot produce breast milk.
M9	Mother performs EIB. Reason: Birth attendants direct mother to perform EIB. Process: 1 hour, skin of mother and baby attached, baby assisted in finding mother's nipple.	Mother gives breast milk and formula milk to her baby. Reason: Mother was unable produce breast milk after delivery and was unable to breastfeed baby while working.

Table 5 also shows M5 received one box of PMT biscuits during pregnancy and ate one packet of PMT biscuits every day with her children. M6 received one box of PMT biscuits every month during pregnancy and ate one box of PMT biscuits in 10 days. According to the guidelines for distribution of PMT biscuits, one box of PMT packages contains seven packages of PMT biscuits or 21 pieces of biscuits. The provision of appropriate PMT biscuits is given to pregnant women with CED in the first trimester as much as two pieces/ day, while in second and third trimesters they are given three pieces of PMT biscuits / day (Minisrty of Health Republic Indonesia, 2012). This shows that number of PMT biscuits consumed by M5 every day is sufficient if she is in the first trimester of pregnancy. It also shows that PMT biscuits distribution in some places is still not on target because M5 had CED so she needed more PMT biscuits during pregnancy than M6.

Mother's Behavior in Performing EIB

Table 1 shows that the midwife had explained about Early Initiation of Breastfeeding (EIB) at the second meeting of the pregnant women class. Table 6 shows eight out of nine mothers (88.9%) had undergone EIB. One mother (M4) did not perform EIB because she was separated from her baby immediately after giving birth. Among eight mothers who did EIB, only one (M7) did EIB because she wanted her child to learn to breastfeed. Seven other mothers did EIB because it was directed by the childbirth officer. Table 2 and Table 3 show that M7 attended all meetings of the pregnant women class and never received information about EIB outside the pregnant women class. This indicates that M7 has received information about EIB from the pregnant women class so that the mother was motivated to perform EIB so her baby can learn to breastfeed. This shows that EIB can be influenced by the knowledge of mother because of her presence in the pregnant women class, but EIB is also influenced by other factors, which is advice or support from birth attendants. Although Table 6 shows that most of mothers have performed EIB with recommendation of birth attendants, all mothers still have not carried out EIB properly. But, based on results of this study, it was found that even though all mothers had direct contact between the skin of mother and baby, they still helped babies to find nipples or the duration of EIB implementation was still less than one hour.

Mother's Behavior in Exclusive Breastfeeding

Table 1 shows midwives explained about exclusive breastfeeding in the second meeting of the pregnant women class. Table 6 shows that four (M1, M2, M3, and M6) out of nine mothers gave exclusive breastfeeding to their babies, because they felt that nutritional content of breast milk was more complete than formula milk. M2 had another reason for giving exclusive breastfeeding to her baby, that she gets paid leave from work after giving birth. M6 gave exclusive breastfeeding to her baby because she did not work, received support from her husband and wanted to follow recommendation of health workers. Table 2 and Table 3 show M6 is the only mother who was accompanied by her husband at the pregnant women class and four mothers never received exclusive breastfeeding information outside the pregnant women class. This indicates that exclusive breastfeeding is influenced by the presence of mothers in the pregnant women class as well as other factors such as mother's job and husband's support.

Table 6 also shows that five other mothers (55.6%) didn’t provide exclusive breastfeeding or had given formula milk to their babies aged less than six months. The reason M7, M8 and M9 didn’t provide exclusive breastfeeding was because they could not produce breast milk. M9 did not provide exclusive breastfeeding because she worked after giving birth. On the other side, M4 and M5 did not provide exclusive

breastfeeding because their baby had received formula milk from hospital workers and their husbands lack knowledge of exclusive breastfeeding. Table 2 shows that five mothers were never accompanied by their husbands during the pregnancy class. This indicates that exclusive breastfeeding is influenced by the ability of mothers to produce breast milk, mother's job and knowledge of husband.

DISCUSSION

Nutrition Education in Pregnant Women Class Program

Nutrition education is important during pregnancy to maintain the health of the mother and the baby she is carrying. One of the existing facilities is the pregnant women class. Antenatal class not only increases information for mothers (and husband / family) regarding optimization during pregnancy, but also parenting preparations for the nutritional needs of infants and breastfeeding mothers (Barimani et al., 2018). Classes for pregnant women are still rarely carried out independently, mostly nutrition education is through antenatal care, but even this is only done at the beginning of the meeting and is ineffective (Nankumbi et al., 2018). Classes for pregnant women are usually led by a local midwife and this shows the important role of the midwife in providing information to pregnant women (Arrish et al., 2014).

Based on the study in four public health centers in Surabaya it shows that village midwives or implementing midwives had already delivered nutrition information at every meeting of pregnant women classes in 2019 using a flipchart for pregnant women class and KIA books. Nutrition information presented in pregnant woman classes in Surabaya is such as recommended foods during pregnancy and breastfeeding or postpartum, anemia, consume iron supplements, chronic energy deficiency, early initiation of breastfeeding (EIB), exclusive breastfeeding, low birth weight babies, and food myths for mothers and babies.

Nutrition Education Outside Pregnant Women Class Program

Nutrition education can be obtained from anywhere, including pregnant women classes. However, pregnant women often have problems including time, resources, and lack of means of providing nutrition education (Lucas et al., 2014). The internet is a solution for pregnant women in getting information about their pregnancy (Sayakhot and Carolan-Olah, 2016). A study in Italy reported that most pregnant women obtained pregnancy information online even though they had received health education because it was easier and simpler (Bert et al., 2013). But this needs to be a concern for health workers to straighten out any information that may not be appropriate (Sayakhot and Carolan-Olah, 2016).

Based on study in four public health centers in Surabaya it shows that six mothers out of nine informants who participated in pregnant women classes in 2019 had already got nutrition information from outside the pregnant women class. Sources of nutrition information that informants get from outside pregnant women classes are KIA book, internet, online group, counselling at posyandu or counselling from obstetrician. Most informants (four of six mothers) got that nutrition information from internet. Nutrition information that almost every mother gets outside pregnant women classes is foods that are recommended for pregnant women. The result shows that three mothers found it easier to understand nutrition information from pregnant women classes than outside pregnant women classes, one mother felt both nutrition information from the pregnant women class and from the outside was easy to understand, while two mothers found it easier to understand nutrition information from outside pregnant women classes than pregnant women classes. One mother

found it easier to understand nutrition information from outside pregnant women classes because she was unable to concentrate when other participants were noisy. Another mother found it easier to understand nutrition information from outside the pregnant women classes because she just attended one meeting. Among the reasons for mothers who find it easier to understand the material from pregnant women classes is that the midwife uses simple language and uses the KIA book and flipchart in explaining the material and participants can have direct discussions with health workers. That indicates that the nutritional material described by the midwife in pregnant women classes in Surabaya was delivered quite well.

Individual Outcome of Nutrition Education in Pregnant Women Class Program

Energy and nutritional needs of women increase during pregnancy to be able to fulfill the nutritional needs of mother and fetus in order to grow and develop (Hardinsyah and Supariasa, 2016). In nutrition education in the pregnant women class, it is known that midwives have advised mothers to eat one portion more during pregnancy at the first meeting. Presence of mothers in the pregnant women class can affect the knowledge and awareness of mothers to consume bigger portions during pregnancy. In Western Kenya, the higher presence of antenatal clinics for pregnant women significantly associated with higher maternal health knowledge (Perumal et al., 2013). Research in the US reports that most subjects do not meet the needs of vitamins (A, B6, B9, B7, C, D, E, K) and minerals (Fe, K, Ca, Mg, Zn) and even consume excess sodium (Bailey et al., 2019). Deficiencies of certain nutrients can affect the health of the mother and the development of the baby who is being conceived, even postpartum. Pregnant women need additional iron intake to increase iron stores and compensation due to hemodilution, especially in second trimester pregnancy (Cunningham and Al, 2006). Iron can be found as heme iron form in animal foods because it can be absorbed up to 25% while non-heme only 5% (Almatsier, 2004). During the pregnant women class, data in this study show that midwifes from Puskesmas advised mothers to consume foods that are high in iron, such as liver, eggs, fish, meat and green leafy vegetables such as spinach at the first class meeting. But actually, it is not rare for pregnant women to not have good appetite. The results show that frequency and portion of eating during pregnancy is not only influenced by mother's knowledge of nutrition obtained from inside and outside pregnant women class, but also influenced by physiological conditions experienced by the mother (Omidvar et al., 2018).

Action of most mothers who drink one glass of milk per day is a good thing. It is known that one glass of milk contains about 150 kcal of energy and 7 g of protein (Pritasari et al., 2017). According to Recommended Dietary Allowance for Indonesia 2019, pregnant women need an additional of 180 kcal of energy and 1 g of protein in first trimester, 300 kcal of energy and 10 g of protein in second trimester, as well as 300 kcal of energy and 30 g of protein in third trimester (Ministry of Health Republic Indonesia 2019). Therefore, it is not enough for pregnant women to only consume one glass of milk / day. One cup of milk/day fulfills protein needs in the first trimester, but doesn't fulfill energy needs in first, second, and third trimesters and didn't fulfill protein needs in second and third trimesters. It shows that mothers need to consume two glasses of milk / day or needs to increase meal portions in a day to fulfill their nutritional needs during pregnancy.

Nutritional needs of women during breastfeeding are higher than pregnant women because mother needs more nutritional intake to produce breast milk (Kominiarek and Rajan, 2016). In the

second meeting of the pregnant women class, the midwife explained that, in order to successfully breastfeed, mothers need food with balanced nutrition. Presence of mothers in the pregnant women class can affect the knowledge and awareness of mothers to consume with more frequency and greater portion of foods during breastfeeding. Frequency and portion of mother's meal while breastfeeding is not only influenced by mother's knowledge of nutrition obtained from the pregnant women class, but also influenced by physiological conditions experienced by the mother. An experimental study proves that giving simple relaxation to breastfeeding mothers affects the level of stress and the amount of breast milk produced (Mohd Shukri et al., 2019). Type of food consumed by mothers while breastfeeding is influenced by mother's knowledge of nutrition obtained from the pregnant women class as well as cultural factors or local beliefs. McLeod et al. (2011) stated that knowledge of breastfeeding mothers is a mediator between socioeconomic conditions and diet quality.

Iron supplementation Tablet (TTD) is a supplement containing 60 mg of ferro sulfate and 400 µg of folic acid taken by pregnant women. Ninety tablets are given starting from the first trimester of pregnancy to prevent anemia. In this study, effect of presence of mothers in pregnant women classes on maternal compliance in consuming blood supplemented tablets still needs to be further reviewed. Research in Sukoharjo shows that nutrition education has an effect on increasing compliance with iron consumption through pregnant women classes (Sulastijah et al., 2015). Maternal preferences also affect TTD consumption in addition to maternal knowledge Research in 2016 in Indonesia showed that husband's support also contributed to the consistency of TTD in pregnant women (Setyobudihono et al., 2016). Husband is a family member who lives at home with the mother, so that he has a very important role in supervising drug taking. Husbands who have high knowledge and awareness about maternal health and nutrition can support mothers to consume TTD during pregnancy (Triharini et al., 2018). Therefore, husbands need also to attend classes for pregnant women at least once to increase their knowledge and awareness about health or nutrition. The presence of a husband during antenatal classes is proven to improve understanding of pregnant women and also prepare themselves for their husbands to become a father later (Aguiar and Jennings, 2015).

In 2012, the Indonesian Ministry of Health distributed PMT programs in an effort to improve nutritional status of mothers during pregnancy in dealing with Chronic Energy Deficiency(CED) problems (Ministry of Health Republic Indonesia, 2012). But, this study results show that effect of the presence of mothers in pregnant women classes in consuming PMT still needs to be further reviewed. The presence of mothers during the class for pregnant women is certainly expected to increase the understanding of mothers about the importance of PMT consumption for mothers who are at risk of CED.

Early Initiation of Breastfeeding (EIB) is the process of placing a newborn to the breast within the first hour of life. EIB is essential for the survival of newborn and for successful long-term or exclusive breastfeeding (United Nations International Children's Emergency Fund, 2018). Not only the presence in pregnant women classes, but also support from birth attendants can influence EIB. If birth attendants advise and direct mothers to carry out EIB immediately after the baby is born, then most mothers would perform EIB. EIB treatment must still be in accordance with the prescribed recommendations to maximize bonding between mother and child. In this study, all pregnant women are not in accordance with Government Regulation of Republic of Indonesia Number 33 year 2012, second part of Article 9 of Early Initiation for Breastfeeding, which basically states that

health service providers are required to carry out EIB for newborn to their mothers for at least one hour (Republic Indonesia, 2012).

Until the age of six months, babies only need to consume breast milk because the nutritional content of breast milk is sufficient for all baby's nutritional needs, known as exclusive breastfeeding (Maryunani, 2010). Just like TTD consumption, husband's support also affects exclusive breastfeeding in pregnant women. Husbands who participate in pregnant women classes having more health and nutrition knowledge, so they can support mothers in giving exclusive breastfeeding to their baby. A cross-sectional study explains that husbands' support is associated with high levels of exclusive breastfeeding for both working and unemployed mothers (Taddele, 2014). Exclusive breastfeeding is also influenced by the ability of mothers to produce breast milk. According to Kent et al. (2012), breastmilk production can be maintained or increased by taking into account the frequency, timing, and amount of breastmilk given.

CONCLUSION

Outcome of nutrition education in the pregnant women class program at individual level in Surabaya 2019 is mothers in consuming high iron foods during pregnancy, frequency and portions of mother's meals increase during pregnancy and breastfeeding, mother's practice of EIB and exclusive breastfeeding. Apart from being influenced by the presence of mothers in pregnant women classes, this behavior is also influenced by other factors. Frequency and portion of mother's meals during pregnancy and breastfeeding are also influenced by physiological conditions experienced by the mother. Practice of EIB is also influenced by advice or support of birth attendants. Exclusive breastfeeding is also influenced by mother's job, ability to produce breast milk, also support and knowledge from husband. Effect of the presence of mothers in pregnant women classes on compliance with consuming iron supplementation tablets and PMT biscuit for pregnant women is not yet known and needs to be studied further.

REFERENCES

Aguiar, C., Jennings, L., 2015. Impact of Male Partner Antenatal Accompaniment on Perinatal Health Outcomes in Developing Countries: A Systematic Literature Review. Matern. Child Health J. 19, 2012–2019. https://doi.org/10.1007/s10995-015-1713-2

Almatsier, S., 2004. Prinsip Dasar Ilmu Gizi. Gramedia Pustaka Utama, Jakarta.

Arrish, J., Yeatman, H., Williamson, M., 2014. Midwives and nutrition education during pregnancy: A literature review. Women and Birth 27, 2–8. https://doi.org/10.1016/j.wombi.2013.02.003

Bailey, R.L., Pac, S.G., Fulgoni III, V.L., Reidy, K.C., Catalano, P.M., 2019. Estimation of Total Usual Dietary Intakes of Pregnant Women in the United States. JAMA Netw. Open 2, e195967–e195967. https://doi.org/10.1001/jamanetworkopen.2019.5967

Barimani, M., Forslund Frykedal, K., Rosander, M., Berlin, A., 2018. Childbirth and parenting preparation in antenatal classes. Midwifery 57, 1–7. https://doi.org/10.1016/j.midw.2017.10.021

Bert, F., Gualano, M.R., Brusaferro, S., De Vito, E., de Waure, C., Torre, G. La, Manzoli, L., Messina, G., Todros, T., Torregrossa, M.V., Siliquini, R., 2013. Pregnancy e-health: a multicenter Italian cross-

sectional study on internet use and decision-making among pregnant women. J. Epidemiol. Community Health 67, 1013 LP – 1018. https://doi.org/10.1136/jech-2013-202584

Cunningham, F., Al, G., 2006. Obstetri Williams Edisi 21 Volume. EGC, Jakarta.

Frye, A.W., Hemmer, P.A., 2012. Program Evaluation Models and Related Theories, AMEE Guide No.67. Med. Teach. 34, e288–e299. https://doi.org/10.3109/0142159X.2012.668637

Hardinsyah, Supariasa, I.D.N., 2016. Ilmu Gizi Teori dan Aplikasi. EGC, Jakarta.

Kent, J.C., Prime, D.K., Garbin, C.P., 2012. Principles for Maintaining or Increasing Breast Milk Production. JOGNN - J. Obstet. Gynecol. Neonatal Nurs. 41, 114–121. https://doi.org/10.1111/j.1552-6909.2011.01313.x

Kominiarek, M.A., Rajan, P., 2016. Nutrition Recommendations in Pregnancy and Lactation. Med. Clin. North Am. 100, 1199–1215. https://doi.org/10.1016/j.mcna.2016.06.004

Lucas, C.J., Charlton, K.E., Brown, L., Brock, E., Cummins, L., 2014. Antenatal shared care: are pregnant women being adequately informed about iodine and nutritional supplementation? Aust. New Zeal. J. Obstet. Gynaecol. 54, 515–521. https://doi.org/10.1111/ajo.12239

Maryunani, A., 2010. Ilmu Kesehatan Anak Dalam Kebidanan. Trans Info Media, Jakarta.

McLeod, E.R., Campbell, K.J., Hesketh, K.D., 2011. Nutrition Knowledge: A Mediator between Socioeconomic Position and Diet Quality in Australian First-Time Mothers. J. Am. Diet. Assoc. 111, 696–704. https://doi.org/10.1016/j.jada.2011.02.011

Ministry of Health (MoH) Republic Indonesia, 2019. Peraturan Menteri Kesehatan No 28 Tahun 2019 tentang Angka Kecukupan Gizi yang Dianjurkan bagi Bangsa Indonesia. Kemenkes RI, Jakarta.

Ministry of Health (MoH) Republic Indonesia, 2014. Pedoman Pelaksanaan Kelas Ibu Hamil. Kemenkes RI, Jakarta.

Ministry of Health (MoH) Republic Indonesia, 2012. Panduan Penyelenggaraan PMT Bagi Balita Gizi Kurang dan Ibu Hamil KEK. Direktorat Bina Gizi, Jakarta.

Mohd Shukri, N.H., Wells, J., Eaton, S., Mukhtar, F., Petelin, A., Jenko-Pražnikar, Z., Fewtrell, M., 2019. Randomized controlled trial investigating the effects of a breastfeeding relaxation intervention on maternal psychological state, breast milk outcomes, and infant behavior and growth. Am. J. Clin. Nutr. 110, 121–130. https://doi.org/10.1093/ajcn/nqz033

Nankumbi, J., Ngabirano, T.D., Nalwadda, G., 2018. Maternal Nutrition Education Provided by Midwives: A Qualitative Study in an Antenatal Clinic, Uganda. J. Nutr. Metab. 2018, 3987396. https://doi.org/10.1155/2018/3987396

Omidvar, S., Faramarzi, M., Hajian-Tilak, K., Nasiri Amiri, F., 2018. Associations of psychosocial factors with pregnancy healthy life styles. PLoS One 13, e0191723. https://doi.org/10.1371/journal.pone.0191723

Perumal, N., Cole, D.C., Ouédraogo, H.Z., Sindi, K., Loechl, C., Low, J., Levin, C., Kiria, C., Kurji, J., Oyunga, M., 2013. Health and nutrition knowledge, attitudes and practices of pregnant women attending and not-attending ANC

clinics in Western Kenya: a cross-sectional analysis. BMC Pregnancy Childbirth 13, 146. https://doi.org/10.1186/1471-2393-13-146

Pritasari, Didit, D., Nugraheni, T.L., 2017. Gizi Dalam Daur Kehidupan. Pusat Pendidikan Sumber Daya Manusia Kesehatan, Jakarta.

Republic Indonesia, 2012. Peraturan Pemerintah Republik Indonesia Nomor 33 Tahun 2012 tentang Pemberian Air Susu Ibu Eksklusif.

Sayakhot, P., Carolan-Olah, M., 2016. Internet use by pregnant women seeking pregnancy-related information: a systematic review. BMC Pregnancy Childbirth 16, 65. https://doi.org/10.1186/s12884-016-0856-5

Setyobudihono, S., Istiqomah, E., Adiningsih, S., 2016. Husband Influences on Pregnant Women Who Following Consumption Iron Supplementation Program. Procedia - Soc. Behav. Sci. 222, 160–168. https://doi.org/10.1016/j.sbspro.2016.05.207

Sulastijah, S., Sumarni, D.W., Helmyati, S., 2015. Pengaruh pendidikan gizi dalam upaya meningkatkan kepatuhan konsumsi zat besi melalui kelas ibu hamil. J. Gizi Klin. Indones. 12, 79–87. https://doi.org/10.22146/ijcn.23125

Taddele, M., 2014. Exclusive Breastfeeding and Maternal Employment in Ethiopia: A Comparative Cross-Sectional Study. Int. J. Nutr. Food Sci. 3, 497. https://doi.org/10.11648/j.ijnfs.20140306.12

Triharini, M., Sulistyono, A., Adriani, M., Armini, N.K.A., Nastiti, A.A., 2018. Adherence to iron supplementation amongst pregnant mothers in Surabaya, Indonesia: Perceived benefits, barriers and family support. Int. J. Nurs. Sci. 5, 243–248. https://doi.org/10.1016/j.ijnss.2018.07.002

United Nations International Children's Emergency Fund, 2018. Capture The Moment Early initiation of breastfeeding: The best start for every newborn. Nutrition Section, Programme Division and Data, Analytics and Innovation, Division of Data, Research and Policy, New York.