



## The Effort to Healthy Pregnancy Through Education on Physical Activity, Nutrition and Body Mechanics

Milatun Khanifah 1\*, Rini Kristiyanti 1, Fitriyana 1, Suparni<sup>1</sup>, Erma Yunianti<sup>2</sup>

Prodi Sarjana Kebidanan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Pekajangan<sup>1</sup>

Pusat Kesehatan Masyarakat (PUSKESMAS) Noyontaan, Kota Pekalongan<sup>2</sup>

Corresponding Email\* : milahanifah1980@umpp.ac.id

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### Abstract

Pregnancy as a physiological process is often an obstacle to maintaining optimal health due to the discomfort that occurs during this period. Various obstacles due to discomfort can prevent pregnant women from being physically active, implementing a healthy diet. In addition, in the 3rd trimester of pregnancy, most pregnant women experience the discomfort of back pain, and many are not aware of the management that can be done. This condition causes pregnant women to be unfit during the pregnancy process. This community service program aims to increase the knowledge of pregnant women related to physical activity, nutrition and body mechanics so that the pregnancy is a quality process. This community service was conducted in Noyontaansari sub district, the working area of Pekalongan City Noyontaan Health Center, which was attended by 29 pregnant women. The activity was carried out in the form of education in pregnant women's class activities. There was an increase in the knowledge level of pregnant women before and after the education. The knowledge tested included knowledge about physical activity (exercise), nutrition and body mechanics for pregnant women. The pre-test results showed that most (62%) had a moderate level of knowledge, 7% had less knowledge and only 31% had good knowledge. After the training, the post-test results showed that all pregnant women had a good level of knowledge. This is an indication of the success of the PkM activities in improving knowledge.

### 1. Introduction

Improving health and well-being is a key goal of global health care. Midwives and other health care providers have an important role in educating women about health during pregnancy (Zinsser et al., 2020). Pregnancy is a vulnerable period for mothers to maintain their health status. Many things become obstacles in implementing a healthy lifestyle, including doing regular exercise or physical activity and implementing a healthy diet (Grenier et al., 2021).

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pregnant women which showed that the majority of pregnant women (77.7%) were in the sedentary. Improving health and well-being is a key goal of global health care. Midwives and other health workers have an important role in educating women about health during pregnancy (Zinsser et al., 2020). Pregnancy is a vulnerable period for mothers to maintain their health status. Many things become obstacles in implementing a healthy lifestyle, including doing regular exercise or physical activity and implementing a healthy diet (Grenier et al., 2021). A less active lifestyle or living a sedentary life. This is evidenced by the results of a study conducted by Carvalhaes on 256 pregnant women which showed that the majority of pregnant women (77.7%) were in the sedentary category (De Barros Leite Carvalhaes et al., 2013). This kind of thing can increase the risk of pregnant women experiencing excessive weight gain and the emergence of other complications in pregnancy.

On the other hand, pregnant women, especially those who have entered the 3rd trimester of pregnancy, experience a lot of discomfort, especially lower back pain. It is estimated that around 50% of pregnant women complain of lower back pain. The intervention that has proven to have the best quality in reducing back pain complaints is acupuncture, followed by physical exercise or exercise.

However, acupuncture must be performed by specialized personnel and requires costs. Exercise and applying proper body mechanics are effective and efficient options that can be done by pregnant women. Based on the results of the initial assessment in the working area of the Noyontaan Public Health Center, it was found that most of the pregnant women had a sedentary lifestyle, besides, the local community's habit of meeting their nutritional needs was to buy food from local food stalls which were not of guaranteed quality.

The health problems faced by pregnant women in the area, especially those in the last trimester of pregnancy, are back pain and sleep disorders. The education provided during pregnancy classes is still curative efforts and awareness of pregnancy complications. Efforts to improve the quality of health of pregnant women have not received attention. On the other hand, the community in the working area of Puskesmas Noyontaan, has the potential to be able to improve the problems faced, namely their good participation in activities organized by Noyontaan Public Health Center. Lack of physical activity or exercise, improper diet and complaints of back pain in pregnant women can reduce the quality of their health. In an effort to increase the awareness of mothers about the importance of these three things so that mothers through pregnancy with optimal health conditions or with fit conditions. It is one of the responsibilities of midwives to provide education about this. Thus, community service activities for education towards a fit pregnancy with physical activity, nutrition in pregnant women and body mechanics in pregnancy are steps that need to be taken.

## **2. Methods of Implementation**

This community service program (PKM) was carried out with the following approach method:

- a. Preliminary mapping

Preliminary mapping as a step to understand the community, so that the implementers of PKM can easily understand the reality of the problems that occur (Amin, C, et al., 2023).

- b. Building trust

That was done to build an equal and mutually supportive relationship between the implementer and the partner community.

c. Set the agenda for the PKM

This step was carried out to organize activities to fit into the community's activity schedule. An agenda of activities related to the health problems of pregnant women in the working area of Noyontaan Public Health Center was prepared.

d. Organization

In this case, the work organization was carried out between the community service implementers, midwives of the maternal and child health coordinator, midwives in charge of Noyontaan area and health cadres.

e. Carrying out activities or initiating actions

This was done through actions in the form of education of pregnant women in groups or classes of pregnant women. This education aims to improve the quality of health of pregnant women. Education on how to achieve a healthy pregnancy through physical exercise (sports), nutrition for pregnant women and body mechanics. Counseling was conducted in small groups of 9-10 pregnant women each. The aim was to make the counseling more optimal. The counseling methods used included: lecture, discussion, and demonstration. The demonstration method was mainly used in counseling pregnant women.

The first period counseling session was held at the cadre's house and was attended by 10 pregnant women. The second period of counseling was conducted at Noyontaansari subdistrict office and attended by 10 pregnant women. The third counseling was conducted at the Noyontaan Public Health Center hall and was attended by 9 pregnant women. For each stage of counseling, before and after counseling, participants were given questions that included physical activity (exercise), nutrition, and body mechanics. The aim was to determine the success rate of counseling implementation.

The barriers faced in this activity are related to the place of implementation. Because the Puskesmas hall is also used for other activities, so the first and second stage of counseling were held at the cadre's house and the village office. However, this did not diminish the importance of conducting PKM activities, as evidenced by the presence of all invited pregnant women and their active participation during the activities.

### **3. Results and Discussion**

This PKM program was attended by 29 pregnant women and was held in three periods at different locations. Data on the pregnant women were collected. A pre-test was done before the education and a post-test was done after the education. This was done to determine the success rate of the education. The implementation of this class is shown in Figure 1, Figure 2 and Figure 3:



Figure 1. Antenatal class at the cadres' house



Figure 2. Antenatal class at Noyontaansari Sub-district office



Figure 3. Antenatal Class at Noyontaan Health Center, Pekalongan City

### 3.1. Characteristic of Pregnant Women (Participants)

The following shows the characteristics of pregnant women who participated in the community service activities of the Pregnant Women Class in Noyontaansari Subdistrict, Noyontaan Puskesmas Pekalongan City. Respondent characteristic are shown in Table 1:

Table 1. Characteristic of Pregnant Women

Characteristic	Analysis	
	Frequency	Persentase (%)
<b>Age (year)</b>		
< 20	1	3
20-35	24	83
> 35	4	14
<b>Gravidity</b>		
Primigravida	9	31
Multigravida	20	69
<b>Gestational Age</b>		
1 <sup>st</sup> Trimester	1	3
2 <sup>nd</sup> Trimester	10	34
3 <sup>rd</sup> Trimester	18	62
<b>Occupation</b>		
Housewife	25	86
Women worker	4	14
<b>Education Level</b>		
Elementary School	15	52
Junior and Senior High School	11	38
Higher Education	3	10

#### Primary data

##### a. Age of pregnant mother

Most pregnant women were in the healthy reproductive age category (83%). This means that most of these pregnant women were at the ideal age for pregnancy. It was therefore expected that the incidence of pregnancy complications caused by high-risk age factors, such as pre-eclampsia, chronic energy deficiency and presentation abnormalities, will be lower.

A study conducted at Zaionel Abidin Hospital showed that there was a significant difference in the incidence of pre-eclampsia between high-risk age group (< 20 years and > 35 years) and non-risk or healthy reproductive age group (20-35 years) (p value = 0.001). Mothers in the high-risk age group have a higher risk of pre-eclampsia compared to mothers in the healthy reproductive age group (OR = 9.444) (Marniarti et al., 2016).

In her research, Ernawati demonstrated that there was a significant difference between mothers of high risk age (< 20 years and > 35 years) and healthy reproductive age (p value 0.03). Pregnant women who were too young and too old had a 4 times higher risk of experiencing chronic energy deficiency during pregnancy compared to pregnant women aged 20-35 years (Ernawati, 2018).

**b. Status Gravida**

More than half (69%) of the participants in this PKM were multigravida. Research using qualitative methods shows that factors associated with achieving ideal weight as a form of healthy behaviour are influenced by gravida status. The burden of increased household responsibilities is one of the main factors preventing pregnant women from achieving ideal weight (Mehrabi et al., 2021). In terms of diet, a study by Wesolowska et al. showed that multiparous mothers were significantly more likely to follow a Western diet as a function of parity. Western diets are characterised by refined grains, processed meats and potatoes, or foods high in carbohydrates. Western diets tend to be more convenient. The choice of this type of diet is likely to be influenced by their status as multiparas as opposed to primiparas. Multiparas pay more attention to the condition of their pregnancy compared to those who already have children (Wesołowska et al., 2019).

Multigravida have more responsibilities in the family than primigravida. This indicates that most participants have more responsibilities in the family. Most participants in this PKM activity have greater challenges in implementing healthy behaviours related to their level of gravidity.

**c. Gestational Age**

Most participants (96%) had passed the first trimester of pregnancy. This was the time when nausea, one of the discomforts of pregnancy, has disappeared. In a study of 549 pregnant women in the first trimester, nausea was found to be the main barrier to physical activity or exercise. Good education and intervention on this barrier to exercise can increase the motivation of pregnant women to engage in the level of exercise needed to maintain their health (Sytsma et al., 2021). In addition to the lifestyle adopted through physical activity, the type of diet may also change in the third trimester. In a study conducted by Meander, et al. (2021), in the 3rd trimester, women who were younger than 28 years, did not have a university degree, had lower nutritional knowledge and lived in an urban area had a lower diet quality ( $p < 0.05$ ). The education on exercise during pregnancy provided in this PKM activity is a form of activity to increase mothers' motivation to be active. This is supported by the condition of most pregnant women in the 2nd and 3rd trimester.

#### d. Occupation

86% of pregnant women who participated in community service program were housewives. Pregnant women involved in PKM have many opportunities to implement recommendations for a healthy lifestyle during pregnancy in the form of exercise during pregnancy and a healthy diet during pregnancy.

A study of 256 pregnant women found that 77.7% of pregnant women were inactive in physical activity. Most of their energy was expended on household activities. Having a job outside the home reduces the opportunity to implement recommendations in the form of increased physical activity and a healthy diet during pregnancy (De Barros Leite Carvalhaes et al., 2013). Working women have more barriers to taking exercise and following recommendations for a healthy diet during pregnancy than housewives

#### e. Level education

90% of the mothers participating in PKM had only primary and secondary education, and only 10% had completed higher education. The results of a study conducted by Carvalhaes showed that older age ( $\beta = 0.2$ ;  $p < 0.01$ ), higher education level ( $\beta = 0.2$ ;  $p < 0.01$ ) and better economic status ( $\beta = 0.2$ ;  $p < 0.01$ ) were positive determinants of adopting a healthy diet (Wesołowska et al., 2019).

In this PKM program, most mothers had a primary or secondary education. This condition was likely to result in pregnant women paying less attention to practicing a healthy diet during pregnancy. The approach through education on healthy eating for pregnant women in this PCM activity was a step to increase awareness of the importance of implementing a healthy diet during pregnancy.

### 3.2. Physical Activity During Pregnancy

Most participants (83%) were classified as sedentary/insufficiently active. This is shown in Table 2:

Table 2 Physical Activity

Physical Activity Category	Frequency	Percentage (%)
Sedentary/insufficiently active	24	83
Recreational athlete/moderately active	5	17
Vigorously active	0	0
Total	29	100

Higher levels of physical activity are associated with a lower risk of emergency caesarean section, lower weight gain during pregnancy and better health. While sedentary conditions (less active in doing physical activity) are associated with poor health (Meander et al., 2021). Thus, most of the participants in this PKM program had a higher risk of experiencing poor health and even a risk of experiencing an emergency Caesarean section because most of them were sedentary.

### 3.3. Type of Physical Activity

Although pregnancy exercises were the most common type of exercise performed by pregnant women (83%), walking was the most common type of routine exercise performed by pregnant women (38%), followed by pregnancy exercises (7%). This is shown in Table 3:

Table 3 Type of Physical Activity

	Type of Physical Activity							
	Walking		Pregnancy exercise (gymnastic)		Yoga		Swimming	
	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
Routinely	11	38	2	7	0	0	0	0
Often	12	42	22	76	1	3	5	17
Rarely	6	21	5	17	28	97	24	83
Total	29	100	29	100	29	100	29	100

Walking is one type of exercise that can be used as a physical activity intervention for pregnant women in low- and middle-income countries. This is very feasible because walking does not require any special equipment or cost. However, there are no clear guidelines on the indication and duration of walking for pregnant women and the intensity, which is adapted to the mother's pre-pregnancy activity level (De Barros Leite Carvalhaes et al., 2013). Walking is the most commonly chosen physical activity during pregnancy and has several benefits for both the mother and the foetus. Pregnant women have many barriers to exercise, but this is not the case for walking. Walking can be recommended as one of the sports for pregnant women, but there is still a need to develop appropriate methods to measure walking activity in pregnant women (Connolly et al., 2019).



### 3.4. Level of Knowledge

There was a difference in mothers' level of knowledge between the pre- and post-tests, as shown in Table 3.4. The knowledge tested was knowledge that includes physical activity or exercise, meeting the nutritional / dietary needs of pregnant women, and managing pregnancy symptoms. This shows that the counselling was successful in improving the mothers' knowledge. The barriers related to the location did not become obstacle to the provision of the counselling. To determine the knowledge of pregnant women is shown in the table 4:

Table 4 Level of Knowledge of Pregnant Women

Knowledge Level Category	Pre Test		Post Test	
	Frequency	Percentage	Frequency	Percentage
Not Enough	2	7%	0	0%
Enough	18	62%	0	0%
Good	9	31%	29	100%

Pregnant women who received interactions in the form of education on nutrition and healthy reproduction showed an increase in knowledge, behaviour and practices related to maternal nutrition and healthy reproduction. The results of testing the level of knowledge during the pre-test between the group that received the intervention and the control group did not show a significant difference, but during the post-test after the education was given to the intervention group, there was a significant difference ( $P < 0.001$ ) (Permatasari et al., 2021).

Many factors support the successful implementation of antenatal education. In their study, Patriajati and Sriatmi proved that (initial knowledge possessed by mothers, support from health care provider, facilities and infrastructure, and history of illness and pregnancy were proven to jointly influence mothers' participation in antenatal classes, with health worker support having the most dominant influence (OR 5.394) (Patriajati & Sriatmi, 2019). Midwives are health workers with expertise in pregnancy, childbirth and postnatal care. This is an ideal position for midwives to provide support to improve maternal health during pregnancy, so it is expected that they will indirectly contribute to behavioural changes in pregnant women so that their pregnancy goes optimally (Zinsser et al., 2020).

Health care provider, particularly midwives, play an important role in the successful implementation of antenatal classes. Indicators of success include an increase in maternal knowledge about the topics covered in the classes.

## 4. Conclusion

This PKM program was carried out over one month. The first week was a preparatory activity, the second to the fourth week was the implementation of the maternity classes. The implementation of the motherhood classes was carried out in three different places, because there were obstacles in the form of concurrent schedules in the Puskesmas hall with the schedule of the motherhood classes. However, this condition did not hinder the success of the implementation of the maternity classes. This is evidenced by the attendance of all

pregnant women who received invitations, namely 29 pregnant women, and an increase in maternal knowledge before and after the education. It is expected that health workers, especially midwives, will continue to be a driving force in improving the healthy behaviour of pregnant women, including through efforts to increase knowledge related to pregnant women's health.

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## 6. References

- Banning, A., & Pollard, C. (2020). Current evidence supporting physiotherapy treatment for women with low back pain or lumbopelvic pain during pregnancy. *Csp.Org.Uk*, 126(2008), 29–37. [https://www.csp.org.uk/system/files/documents/2020-01/07\\_banning\\_pollard.pdf](https://www.csp.org.uk/system/files/documents/2020-01/07_banning_pollard.pdf)
- Amin, C., Sari, D. N., Priyono, K. D., & Hidayah, B. (2023). Check for updates The Spatial Pattern of COVID-19 Incidence in Relation to Poverty Across Central Java Province. *In Proceedings of the International Conference of Geography and Disaster Management (ICGDM 2022)* (Vol. 755, p. 450). Springer Nature.
- Connolly, C. P., Conger, S. A., Montoye, A. H. K., Marshall, M. R., Schlaff, R. A., Badon, S. E., & Pivarnik, J. M. (2019). Walking for health during pregnancy: A literature review and considerations for future research. *Journal of Sport and Health Science*, 8(5), 401–411. <https://doi.org/10.1016/J.JSHS.2018.11.004>
- De Barros Leite Carvalhaes, M. A., De Almeida Martiniano, A. C., Malta, M. B., Takito, M. Y., & D'Aquino Benício, M. H. (2013). Physical activity in pregnant women receiving care in primary health care units. *Revista de Saude Publica*, 47(5), 958–967. <https://doi.org/10.1590/S0034-8910.2013047004689>
- Ernawati, A. (2018). Hubungan Usia Dan Status Pekerjaan Ibu Dengan Kejadian Kurang Energi Kronis Pada Ibu Hamil. *Jurnal Litbang: Media Informasi Penelitian, Pengembangan Dan IPTEK*, 14(1), 27–37. <https://doi.org/10.33658/jl.v14i1.106>
- Grenier, L. N., Atkinson, S. A., Mottola, M. F., Wahoush, O., Thabane, L., Xie, F., Vickers-Manzin, J., Moore, C., Hutton, E. K., & Murray-Davis, B. (2021). Be Healthy in Pregnancy: Exploring factors that impact pregnant women's nutrition and exercise behaviours. *Maternal and Child Nutrition*, 17(1), 1–9. <https://doi.org/10.1111/mcn.13068>
- Marniarti, Rahmi, N., & Djokosujono, K. (2016). Analisis hubungan usia, status gravida dan usia kehamilan dengan pre-eklampsia pada ibu hamil di Rumah Sakit Umum dr . Zaionel Abidin Provinsi Aceh. *Journal of Healthcare Technology and Medicine*, 2(1), 99–109. <http://jurnal.uui.ac.id/index.php/JHTM/article/view/353>
- Meander, L., Lindqvist, M., Mogren, I., Sandlund, J., West, C. E., & Domellöf, M. (2021). Physical activity and sedentary time during pregnancy and associations with maternal and fetal health outcomes: an epidemiological study. *BMC Pregnancy and Childbirth*, 21(1), 1–11. <https://doi.org/10.1186/s12884-021-03627-6>

- Mehrabi, F., Ahmaripour, N., Jalali-Farahani, S., & Amiri, P. (2021). Barriers to weight management in pregnant mothers with obesity: a qualitative study on mothers with low socioeconomic background. *BMC Pregnancy and Childbirth*, 21(1), 1–10. <https://doi.org/10.1186/s12884-021-04243-0>
- Patriajati, S., & Sariatmi, A. (2019). Determinants of Mothers' Participation in Antenatal Classes. *Jurnal Administrasi Kesehatan Indonesia*, 7(2), 139. <https://doi.org/10.20473/jaki.v7i2.2019.139-146>
- Permatasari, T. A. E., Rizqiya, F., Kusumaningati, W., Suryaalamsah, I. I., & Hermiwahyoeni, Z. (2021). The effect of nutrition and reproductive health education of pregnant women in Indonesia using quasi experimental study. *BMC Pregnancy and Childbirth*, 21(1), 1–15. <https://doi.org/10.1186/s12884-021-03676-x>
- Sytsma, T. T., Zimmerman, K. P., Manning, J. B., Jenkins, S. M., Nelson, N. C., Clark, M. M., Boldt, K., & Borowski, K. S. V. O.-27. (2021). Perceived Barriers to Exercise in the First Trimester of Pregnancy. *J Perinat Educ*, 4, 198–2018. <https://doi.org/10.1891/1058-1243.27.4.198>
- Wesołowska, E., Jankowska, A., Trafalska, E., Kałużny, P., Grzesiak, M., Dominowska, J., Hanke, W., Calamandrei, G., & Polańska, K. (2019). Sociodemographic, lifestyle, environmental and pregnancy-related determinants of dietary patterns during pregnancy. *International Journal of Environmental Research and Public Health*, 16(5). <https://doi.org/10.3390/ijerph16050754>
- Zinsser, L. A., Stoll, K., Wieber, F., Pehlke-Milde, J., & Gross, M. M. (2020). Changing behaviour in pregnant women: A scoping review. *Midwifery*, 85, 102680. <https://doi.org/10.1016/j.midw.2020.102680>