Effectiveness of Online Learning to Improve Knowledge about Metabolic Syndrome in Pregnancy

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ABSTRACT

Background: Metabolic syndrome is a persistent global health problem and a risk factor for diabetes and heart disease. A metabolic syndrome that occurs during pregnancy will pose a threat to maternal and fetal health. The incidence of metabolic syndrome during pregnancy, especially in developing countries, will become a serious public health problem in the future. This study aims to assess the effectiveness of online learning in improving the knowledge of online learning participants on metabolic syndrome cases in pregnancy.

Subjects and Method: This was a cross-sectional study conducted in July through Zoom online learning on Metabolic Syndrome in Pregnancy attended by 125 participants. The dependent variable was knowledge about metabolic syndrome in pregnancy. The independent variable was online learning. The data obtained from this study were in the form of pretest and post-test scores. The data were analyzed by t-test.

Results: The mean score of knowledge about metabolic syndrome in pregnancy after online learning was higher (Mean= 90.8; SD= 14.05) than before (Mean= 60.08; SD= 6.94), and this was statistically significant (p= <0.001).

Conclusion: Online learning is effective to improve knowledge about metabolic syndrome in pregnancy among Indonesian Obstetrics and Gynecology Association (POGI) members and young POGI members.

Keywords: metabolic syndrome, pregnancy, online learning.

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BACKGROUND

Metabolic syndrome is defined as the presence of at least 3 (three) of the metabolic risk factors including abdominal obesity, high triglycerides, low HDL, high blood pressure, and elevated fasting blood sugar. Metabolic syndrome is a persistent global health problem and a risk factor for diabetes and heart disease (Grieger et al., 2018). Metabolic abnormalities that are the main focus in metabolic syndrome include dysglycemia, hypertension, and atherogenic dyslipidemia which are pathogenetically associated with central obesity (Dabou et al., 2022). The prevalence of metabolic syndrome is higher in women, especially in pregnant women. Metabolic syndrome that occurs during pregnancy will initiate a threat to maternal and fetal health. The incidence of metabolic syndrome that occurs during pregnancy, especially in developing countries, will become a serious public health problem in the future (Ryckman et al., 2013).

Gestational diabetes mellitus is mild to severe glucose intolerance with onset during pregnancy (Coustan, 2013). Gestational diabetes can be caused by pancreatic beta cell dysfunction or insulin resistance secondary to placental hormone release. Other hormones that influence the formation of gestational diabetes include growth hormone, prolactin, corticotropin- releasing hormone, and progesterone (Jawad and Ejaz, 2016). Risk factors for a pregnant woman having diabetes include increased weight, decreased physical activity, a family history of diabetes, a previous history of gestational diabetes or having a macrosomia baby, low HDL, triglycerides above 250, having PCOS, HbA1c above 5.7, acanthosis nigricans, and a previous history of cardiovascular disease (Mack and Tomich, 2017). Complications of gestational diabetes include fetal macrosomia, neonates' respiratory distress, increased perinatal mortality, and hypocalcemia.

While maternal complications include hypertension, preeclampsia, and the possibility of cesarean section (Chiefari et al., 2017).

Obesity in women is such a common problem that obesity that occurs during pregnancy is often overlooked (Catalano and Shankar, 2017). Maternal obesity has short- and long-term adverse effects for both mother and child (Cedergren, 2004). The most common complications of gestational obesity include gestational diabetes, VTE, preeclampsia, gestational hypertension, and cesarean section. Meanwhile, the risks that exist in the fetus include congenital abnormalities such as spina bifida, omphalocele, CHD, and macrosomia (Anderson et al., 2005).

Hypertensive disorders in pregnancy, including chronic hypertension, with or without pre-eclampsia/ eclampsia, gestational hypertension, and HEELP syndrome cause the risk of morbidity to the mother and fetus. Morbidities that can occur due to gestational hypertension include eclampsia, ICH, pulmonary edema, renal failure, coagulopathy, hemolysis, thrombocytopenia, IUGR, oligohydramnios, and placental abruption (Spiro, 2018; Miller et al., 2020). Risk factors for gestational hypertension include a history of preeclampsia, history of HELLP syndrome, gemelli pregnancy, BMI>30, autoimmune diseases, age at conception above 35 years, nulliparous, or having a family with a history of gestational hypertension (Dymara-Konopka et al., 2018; ACOG, 2020).

General knowledge of the risks and management of metabolic syndrome during pregnancy is an important point in ANC. Health workers have an important role in handling and educating the public about the risk factors and treatments of metabolic syndrome during pregnancy. Therefore, the researcher is interested in examining the knowledge of online learning participants

about metabolic syndrome in pregnancy, especially through pretest and posttest means given before and after online learning. The purpose of this study is to determine the basic knowledge of online learning participants before listening to online learning, and then examine whether there is a difference in knowledge after participants listen to online learning about metabolic syndrome.

SUBJECTS AND METHOD

1. Study Design
The study was a quasi experimental study conducted in July 2023 through online learning held on Zoom media.

2. Population and Sample
The target population is the general public who participate in online learning and online discussions through Zoom Meeting media. Sample collection is random sampling, and 125 samples are obtained for this study.

3. Study Variables
The dependent variable was knowledge about metabolic syndrome in pregnancy. The independent variable was online learning.

4. Operational Definition of Variables
Knowledge through online learning is a learning activity through seminars, which is conducted online without face-to-face meetings.

Knowledge about metabolic syndrome in the form of concepts and understanding obtained about metabolic syndrome, from diagnosis to treatment.

5. Study Instruments
This study used Google Form questionnaires to assess participants' understanding and comprehension of the material. The study tested the validity and reliability of the questionnaire to demonstrate its reach.

5. Data analysis
Online learning conducted in July will be analyzed using SPSS, pretest and posttest results will be analyzed using the Paired T test if normally distributed.

6. Research Ethics
This research has obtained Ethical Clearance from Dr. Moewardi Hospital No.1.4-26/VIII/HREC/2023.

RESULTS

1. Characteristic Sample
This study is participated by 52% male members. And from whole participants 56% are 20-30 years old. From educational level, they are master degree present this online learning (70%).

2. Univariate Analysis
This online learning was held on Thursday, July 13, 2023 using the Zoom Meeting tool. The total sample population in this online learning is 125 participants, with participants coming from POGI members and young POGI members.

The Kolmogorov-Smirnov normality test in Table 2 shows that the data from both groups are normally distributed ($p > 0.05$). This study was then continued using the Paired T test.

3. Bivariate Analysis
The results in Table 3 show that the mean knowledge increased from (Mean= 60.08; SD= 6.94) to (Mean= 90.88; SD= 14.05) before and after the intervention. In Table 3, it shows that statistically, the posttest results are higher than the pretest results with a mean difference of 30.8 points, with a significance value of <0.01, which means there is a significant difference in pretest and posttest scores. In this study, it can be concluded that each variable received significant treatment. As a result, participants' knowledge about metabolic syndrome in pregnancy increased after participating in online learning.

The table shows the result of bivariate analysis of mean score knowledge about metabolic syndrome in pregnancy before

and after online learning among POGI members and young POGI members. There was an increase in mean score knowledge from 60.08 (SD = 6.94) to 90.88 (SD = 14.05). With p score <0.001, this result is considered statistically significant.

Table 1. Characteristic Sample

Characteristic Sample	Frequency (n)	Percentage (%)
Gender		
Male	65	52
Female	60	48
Age		
20-30 years old	70	56
30-40 years old	45	36
>40 years old	10	8
Education Level		
Bachelor Degree	30	24
Master Degree	87	70
Doctoral Degree	8	6

Table 2. Normality Test with Kolmogorov-Smirnov

Group	n	Mean	p
Pretest	125	60.08	0.200
Posttest	125	90.88	0.200

Table 3. Bivariate analysis mean score knowledge about metabolic syndrome in pregnancy before and after online learning among POGI members and young POGI members.

Group	N	Mean	SD	p
Pretest	125	60.08	6.94	<0.001
Posttest	125	90.88	14.05	

DISCUSSION

Metabolic syndrome is a group of risk factors that include metabolic, vascular and inflammatory indicators. Several studies have proven that metabolic syndrome can increase the risk of cardiovascular disease, several types of cancer, type 2 diabetes mellitus, and chronic kidney disease. Normal pregnancy is a pro-inflammatory, pro-thrombotic, insulin-resistant, and hyperlipidemic state. There is an association of metabolic syndrome with complications in pregnant women, namely preeclampsia and gestational diabetes, which can increase the risk of type 2 diabetes mellitus and cardiovascular disease in women later in life. Pregnant women with metabolic syndrome are at greater risk of pregnancy complications than women without metabolic syndrome (Grieger et al, 2018).

Obesity and type 2 diabetes mellitus, which often occur together, are common metabolic disorders faced by women during pregnancy, with an estimated one-third of all pregnancies complicated by maternal obesity. Pregnant women with obesity have an increased risk of complications including gestational diabetes, preeclampsia, and obstetric complications such as: fetal macrosomia, shoulder dystocia, perabdominal labor, and mature labor (Grieger et al., 2018). This indicates that it is important for medical personnel, especially in the field of obstetrics and gynecology, to understand

metabolic syndrome disease, because they will act as experts. Therefore, continuing education is needed for obstetricians and gynecologists to increase knowledge and the importance of metabolic syndrome in pregnant women in order to reduce cases of metabolic syndrome in women. With the reduction of metabolic syndrome cases, it is expected to reduce the risk of complications in pregnant women so that medical personnel in the field of obstetrics and gynecology can reduce the prevalence of morbidity and mortality in pregnant women.

The results of this study show that online learning can increase participants' knowledge about metabolic syndrome in pregnancy. Research on the effectiveness of online learning states that in the implementation of online learning, participants feel satisfied and feel interesting and informative so that participants also get additional knowledge conveyed in the online learning Knowledge of metabolic syndrome in pregnancy is important to know by medical personnel. POGI and young POGI members have an important role as medical personnel to prevent metabolic syndrome in pregnant women. Continuous education is needed for medical personnel to improve their expertise. Online learning is one of the options as a means of education because of its several advantages, namely increasing educational experience, reducing time constraints, overcoming geographical limitations, and low costs (Reeves et al., 2017). The implementation of online learning with the topic of metabolic syndrome in pregnant women can be concluded to improve the understanding of online learning participants as seen from the results of the participants' posttest scores which have increased compared to the pretest scores. This shows that in this study, the effectiveness of online learning implementation in delivering information and knowledge to participants was obtained.

CONFLICT OF INTEREST
There is no conflict of interest related to this research.

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