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**Abstract .** Pregnancy stress is frequently associated with postpartum depression, increased post-partum partner conflicts, and poor quality of mother-infant attachment. Meanwhile, the impacts of pregnancy stress on infants are often related with premature birth, behavioral and emotional developmental problems, and negative influences on the cognitive abilities of children. Therefore, pregnant women need support from internal resources, such as self-awareness and emotional regulation to promote a more positive psychological condition. Many studies showed that mindfulness-based interventions can relieve stress and depression, improve psychological well-being, and promote positive emotions. This study was designed as quasi experimental research to test the effectiveness of mindfulness training on pregnancy stress among pregnant women. Five participants were selected incidentally with average age of 27 years old. Most of them were experiencing their first pregnancy at 25 to 26 weeks of pregnancy. The participants joined one-day mindfulness training. Subsequently, they were asked to practice mindfulness exercises for a week at home. Pregnancy stress was measured by the Tilburg Pregnancy Distress Scale (TPDS) which consisted of Negative Affect (NA) and Partner Involvement (PI) subscales. It was taken in the pre-training, post training and follow-up session. The results showed that there were no significant decrease in pregnancy stress during post training ( $t$  TPDS = 2.07, NA = 2.25, PI = 1.24,  $p > 0.05$ ) and follow-up training ( $t$  of TPDS = 0.94, NA = 1.73, PI = 0.55,  $p > 0.05$ ). Further researches need to be conducted with more gradual methods and sessions, and involve more varied and larger sample sizes.

**Keywords:** Pregnancy stress, mindfulness, intervention.

## INTRODUCTION

Pregnancy can possibly cause rapid physical and emotional changes accompanied by uncertainty about the outcomes of birth for mothers, babies, families, and life afterward. If pregnant women assessed it as a pressure and there is no adaptive treatment, it is likely that they will experience distress that leads to some risks to their health and well-being as well as to influence babies' growth and development (Duncan & Bardacke, 2009).

Studies showed that pregnant women can experience stress during pregnancy and this situation may be sustainable after childbirth. The prevalence of depression among pregnant women is estimated to be 13%, which makes researchers consider it as a major health issue (Bennet et al. O'Hara & Swain; in Brunton, Dryer, Saliba, & Kohlhoff, 2015). Moreover, rather than depression, the increasing anxiety level is also more common during pregnancy (Matthey, Barnett, Howie, & Kavanagh, in Somerville, Dedman, Hagan, et al., 2014; American Psychiatric Association, in Brunton, Dryer, Saliba, & Kohlhoff, 2015). Heron and colleagues (in Somerville, Dedman, Hagan, et al., 2014) found about 15% of women reported to experience anxiety conditions during pregnancy and 13% of them feel it after childbirth.

Several studies have shown that maternal stress is also associated with poor births including premature births. The risk factors are maternal physiological and psychological stress mechanisms (Hogue & Brenner; Holzman, et al., Lederman, et al., Livingstone, et al.; Lockwood; Mirsa, et al.; Rich-Edwards & Grizzard; Schulkin; Stein, et al., Wadhwa, et al., in Duncan & Bardacke, 2009). Anxiety during pregnancy also had long-term negative effects on the cognitive abilities of children (Bergman, Sarkar, Glover, O'Connor, in Somerville, Dedman, Hagan, et al., 2014), behavioral and emotional developmental disorders (O'Connor, Heron, Golding, Beveridge, Glove, in Somerville, Dedman, Hagan, et al., 2014), even worsening the health of women during pregnancy (Johnson and Slade 2003) and postpartum (Matthey et al. Milgrom et al in Somerville, Dedman, Hagan, et al., 2014). Maternal stress was also a significant contributing factor to postpartum depression, increased post-partum maternal conflicts, and quality of mother-infant attachment (Austin & Leader; Austin et al., Leung, et al., Miller, et al. Ruiz & Avant; in Duncan & Bardacke, 2009).

The number of adverse effects of stress during pregnancy indicates the need to prepare or handle the mental preparedness of pregnant women in addition to social support from the surrounding environment. Pregnant women need internal support or resources (such as self-awareness, emotional regulation, and understanding of their needs) as important factors supporting the psychological condition of expectant mothers (Bialy; Schore; Siegel & Hartzell, in Snyder, Shapiro, & Treleaven, 2012). An integrative approach to stress reduction that incorporates mind-body exercises during the prenatal period is necessary in order to help the women improve pregnancy and birth outcomes (Beddoe & Lee, in Duncan & Bardacke, 2009), have healthy parenting, promote infant's physical health and support positive social-emotional development of children (Duncan & Bardacke, 2009). Mindfulness exercises facilitate self-awareness and emotional regulation skills that can be useful for pregnant women (Snyder, Shapiro, & Treleaven, 2012).

Mindfulness according to Kabat-Zinn (in Snyder, Shapiro, & Treleaven, 2012) is a particular way to focus attention: aimed, present, and non-judgment. According to Baer, Smith, Lykins, Button, Krietemeyer, Sauer, Duggan, and Williams (2008), this mindfulness consists of five factors: (1) observing internal and external experiences, such as sensation, cognition, emotion, hearing, and smelling; (2) describing, that is called internal experience with words; (3) acting with awareness that is to pay attention to the activity or event at that time; (4) non-judging of inner experience that takes no evaluative attitude toward thoughts and feelings; (5) non-reactive to inner experience is the tendency to let thoughts and feelings flow without being trapped in them. Mindfulness exercises teach people to focus their attention on the current experience, help them improve self-awareness, and the ability to reassess experiences to avoid habitual self-reactions (Orzech, et al.; Shapiro et al., in Snyder, Shapiro, & Treleaven, 2012). For pregnant women, mindfulness training can facilitate them to assess the emergence of an event as a non-threatening challenge to perform more proactive and adaptive coping efforts and positive emotional states. Thereby, it reduces the stress response that may harm mothers and children's well-being (Duncan & Bardacke, 2009).

Empirical evidence suggested that mindfulness-based interventions can reduce the impact of stress, improve psychological well-being and positive emotions, relieve anxiety and depression, prevent the occurrence or relapse of major depressive disorders and substance abuse, and improve immune function when applied to diverse adult populations (Austin, Baer Davidson, et al. Kabat-Zinn, Lazar; Segal, et al.; Shapiro, et al., Specia, et al.; Williams, et al., Witkiewitz, et al., In Duncan & Bardacke, 2009). Other studies have also shown that this intervention could strengthen the functioning of interpersonal relationships and stress coping skills in couples who tend to be happy (Carson et al. in Duncan & Bardacke, 2009), improve metacognitive awareness in depressed adults (Ma & Teasdale, Teasdale, et al. in Duncan & Bardacke, 2009), and increase satisfaction in caring (Singh, et al in Duncan & Bardacke, 2009). The results at least indicated that when mindfulness-based interventions are applied to pregnant women and also their partners, it would improve their ability to cope with stress especially related to the developmental transition to parenthood so that they can experience adaptive functioning in either positive or negative emotional state (Duncan & Bardacke, 2009).

Based on the research mentioned, we concluded that mindfulness exercise is easy to be applied by pregnant women and beneficial to the physical and psychological condition of mother and child, especially when the exercises are given before work. Interventions to pregnant women in Indonesia have not trained specifically the state of maternal physical and mental integration that affects mother's reaction to the transition of development. Therefore, the research was intended to test the effectiveness of mindfulness-based training on the stress of pregnant women.

## METHOD

Participants in this study were five young adult women with average age of 27 years old. They live in Jakarta and Bogor. Most of them experience the first pregnancy with gestational periods at the 25<sup>th</sup> to 26<sup>th</sup> weeks. They were selected incidentally via a short broadcast to WhatsApp's group informing briefly about the research and mindful pregnancy training for a day at Psychology Faculty of YARSI University. Broadcasts contained a brief description related to the participants' criteria, introduction about mindful pregnancy training and the benefits of the training. Prospective participants who register their names and contact numbers to the researchers were taken as sample.

Training was given in four sessions, and each session took about 60-90 minutes duration. Before the session begins, participants were introduced briefly about mindfulness-based training and its development. The first session is a mindful breathing exercise. The second session is a mindful eating exercise, the third and fourth sessions are a mindful walking exercise and mindful pain. At each session, participants were given examples and guided on how to conduct the exercises. The trainer and his assistant made observations and recorded the responses and later the participants were assigned to give feedback.

Pregnancy stress was measured using Tilburg Pregnancy Distress Scale (TPDS). TPDS was developed by Pop, Pommer, Pop-Purceleanu, Wijnen, Bergink, and Pouwer (2011) based on their survey of pregnant and newborn mothers and pregnant medical practitioners. This scale consists of 16 items containing the Negative Affect (NA) subscale and Partner Involvement (PI) during pregnancy. The NA subscale consists of 12 items while the PI subscale consists of 4 items. The answer option is available on a 4

point answer scale (ranging from 0 = very often, up to 3 = never). This scale was once adapted to Turkish and given to 214 pregnant women in Turkey with good reliability and validity (Ertugrul, Okumus, Tokat, & Bektas, 2015).

The validity and reliability of TPDS in this study were tested in 62 pregnant women. TPDS had a reliability value of 0.84, NA subscale had a reliability of 0.821, and PI subscale had a reliability of 0.865. It showed that TPDS and each subscale were reliable in measuring pregnancy stress. Items on TPDS had the validity coefficient ranging from 0.312 - 0.705.

## RESULT

Pregnancy stress was measured on three occasions, i.e., before the training, after the training, and one week after the training (follow-up). The results showed that most aspects of pregnancy stress decreased after the training and follow-up. The average score of TPDS decreased 5.6 points after training and 2.53 points at follow-up. The mean of NA subscale declined 4.6 points after training and 2.53 points at follow-up. The mean of PI subscale decreased 1.6 points after training and 0.93 points at follow-up. These results suggested that pregnancy stress decreased more after the training than during follow-up. The score description presented in table 2 as follows.

The researchers used a paired sample t-test technique to analyze whether the Mean differences between posttest and follow-up were significant. The results showed that the Mean decrease of each scale was not significant between post-test ( $t$  TPDS = 2.07, NA = 2.25, PI = 1.24,  $p > 0.05$ ) and follow-up ( $t$  TPDS = 0.94, NA = 1.73, PI = 0.55,  $p > 0.05$ ). Thus, mindfulness training in pregnant women was not effective against the stress of pregnant women in this study.

	Pretest			Posttest			Follow-up		
	P D S	NA	PI	TPD S	NA	PI	TP DS	NA	PI
N									
Mean	5,2 0	2,20	,60	,6	,6		2,67	,67	,67
Minimum	,00	,00	00	,00	,00	00	,00	,00	00
Maximum	1,0 0	5,00	,00	9,00	1,00	,00	2,00	4,00	,00
Std. Dev.	,21	3,27	2,9 6	,81	,88	,34	,32	,04	,05

## DISCUSSION

The results of this study indicated that mindfulness training in pregnant women was not effective against pregnancy stress. The Mean difference of TPDS, NA subscale, and PI subscale were not significant between post-test and follow-up session. The results of this study were different from the results of previous studies which suggested that mindfulness training in various adult populations reduced the impact of stress, improved psychological well-being and positive emotions, relieved anxiety and depression, prevented the occurrence or relapse of major depressive disorders and substance abuse, and improved immune function (Austin, Baer, Davidson, et al.; Kabat-Zinn; Lazar; Segal, et al.; Shapiro, et al., Specia, et al.; Williams, et al.; Witkiewitz, et al.; in Duncan & Bardacke, 2009). The results of this study were also incompatible with the results of Dunn, Hanich, Roberts, and Powrie (2012) studies showing decreased levels of anxiety, stress, and depression in pregnant women who attended eight weeks of mindfulness training.

The investigators suspect that the difference in the results with previous studies may occur due to the difference in

length of sessions given in the training. This study only provided four sessions, namely mindful breathing, mindful eating, mindful walking, and mindful pain for one day. After that, participants were given the opportunity to practice at home with a minimum of 5 minutes each day during a week. They were also free to choose the exercises from the given session. Meanwhile, the mindful-based training that developed in America was given for eight weeks (Dunn, Hanich, Roberts & Powrie, 2012) up to 10 weeks (Duncan & Bardacke, 2009) with home exercise for each session. These differences according to the researcher can contribute to the effect of the measured changes.

Based on reviewing the monitoring book given to the participant, each participant performed the exercises but the duration of the exercises between the participants was varied. Participants also reported some obstacles during home exercises, such as difficulties at finding a time and a quiet place to exercise and hampered by daily activities to be done. Some participants also reported the perceived differences while doing the exercises themselves compared to the coach guided. Researchers suspected that these difficulties can contribute to the outcome of the home exercise. In a study conducted by Duncan and Bardacke (2009) and Dunn, Hanich, Roberts, and Powrie (2012), the participants conducted a home exercise session using a guide CD obtained during the training.

Despite the differences in declined Mean of TPDS, NA subscale and PI subscale were not significant. The decrease in pregnancy stress after training was greater than at follow-up session. During the training session, participants can feel the effects of the exercise for a while. For example, during a mindful walking exercise, a participant whose legs were ill can feel better and walk as usual. When the exercise was over, the participants feel the pain again. During lunchtime, some participants admitted to dislike the kind of food given, but while trying to eat mindfully as they had been trained, the participants started to consider that the food was tasteful. The exercise-monitoring book revealed that some participants might feel calmer, more comfortable at rest, more easily relaxed when they were experiencing something that used to cause anxiety. If the training session is held at the original program, the results may make a significant difference in the pregnancy stress measured.

A small number of participants and the decreasing at follow-up may also have an impact on the results of this study. The results cannot be generalized to population of pregnant women living in *Jabodetabek*. The number of

participants was also one of the obstacles in research conducted. Most prospective participants were not able to attend the training due to distance and time of training that was one day and on weekdays. Subsequent research can be undertaken by conducting regular training according to sessions and in some batches with the capacity between 5-10 people in order for getting more effective training and the results can be generalized.

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