Jurnal Proteksi Kesehatan
Vol.12, No.1, Mei 2023, pp. 27 -34
ISSN 2715-1115 (Online), ISSN 2302 – 8610 (Print)

Effectiveness of Mindfulness Interventions on Neonatal Outcomes : A Systematic Review

Faizatul Azimah[1], Finta Isti Kundarti[1*], Eny Sendra[1]
[1]Department of Midwifery, Malang Ministry of Health Polytechnic, Malang, Indonesia
*Corresponding author Email: fintaistikundarti@gmail.com

Article Info

Article history
Received date: 2023-03-09
Revised date: 2023-05-19
Accepted date: 2023-05-31

Abstract
Psychological stress during pregnancy is associated with negative birth outcomes , such as premature birth , low birth weight , symptoms of postpartum depression, and can cause long-term defects in cognitive development. This study aims to determine the effectiveness of mindfulness interventions on neonatal outcomes through a systematic review. The method used in this study is a systematic review by searching articles through the Pubmed, ProQuest, Science Direct, Wiley Library, Sage Journal, and Cochrane Library databases with publication years January 2018 to January 2022. The results of the study obtained 6 articles that met the inclusion criteria. The use of mindfulness interventions for mothers with psychological distress suggests that mindfulness interventions are effective for improving labor outcomes and positive experiences during childbirth. From this study it can be concluded that mindfulness for the future can be used as a non-pharmacological intervention option to reduce psychological distress without risky side effects.

Keywords:
Mindfulness; Neonatal Outcome; Childbirth

INTRODUCTION

The environment in the uterus plays an important role in shaping future growth and development [1]. Psychological stress during pregnancy is associated with negative birth outcomes, such as premature birth, low birth weight, gestational age at birth, indicators of breast feeding, symptoms of postpartum depression, and can cause long-term defects in cognitive development [2]. Physiological changes that occur in response to distress can affect fetal programming. Fetal programming states that the fetus adapts to the environment in the womb to maximize growth and development [3].

Early mother-infant interactions play an Mindfulness is defined as non-judgmental attention to phenomena that are happening in the present moment[6]. Mindfulness is a state of mind that focuses on the present moment without judgment and without involving emotion [7]. The goal of a mindfulness intervention is to pay full attention to any thoughts, sensations, or emotions that arise, and then release them and focus on an object such as the breath[8]. Mindfulness interventions are associated with a reduction in perceived stress, anxiety, and depression, making them useful for reducing maternal pressure during pregnancy and reducing negative labor outcomes for the fetus[9].

Important role in a child's development. The sensitivity shown by mothers and their ability to read infant signs is critical, and infants' relationships and attachment to their primary caregivers significantly shape development in childhood. As a result, infants are prone to depressive symptoms in mothers and maternal pressure can pose risks to children's health risks that can persist into late adolescence and adulthood[4], [5].

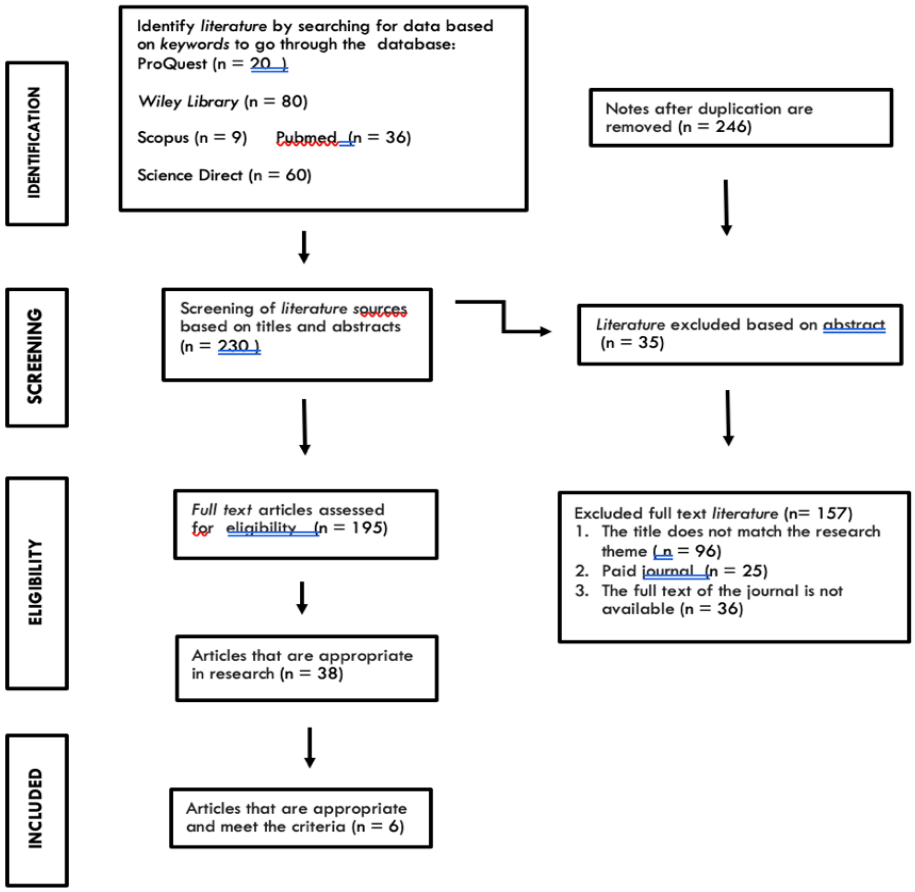
Given the important role of maternal health during pregnancy in the short and long term health of the developing fetus, it is important to

analyze prenatal interventions that can reduce stress on the mother. One of the interventions that can be used is mindfulness.
The purpose of this study was to analyze the effectiveness of mindfulness interventions on neonatal outcomes through a systematic literature review.

METHOD

The method used in this research is *a systematic review* which aims to determine the effectiveness of *mindfulness* interventions on *neonatal outcomes*. Data were identified from 2018 to January 2022. The search was conducted through *the ProQuest, Wiley Library, Pubmed, Science Direct, Sage journal,* and *Cochrane library* databases using the keywords *Mindfulness AND neonatal outcome, mindfulness AND childbirth*. Study selection was carried out by selecting relevant titles and abstracts which were carried out directly by the researcher. Then screening was carried out based on inclusion criteria, namely: original research journals in 2018-2021, with a population of pregnant women using *mindfulness* interventions, journals in English, and full text. Screening and selection of articles using the PRISMA Flowchart.

PRISMA Flow Diagrams



RESULT AND DISCUSSIONS

After seaching through the ProQuest database, Wiley Library, Pubmed, Scopus, Science Direct, Sage journal, Cochrane library found a total of 6 articles that match the keywords, 6 articles that are free of duplication, according to the title theme and full text articles. Screening was carried out to determine articles that fit the inclusion criteria and obtained 6 articles that met the criteria with a total of 1,350 women with third trimester pregnancies. The study used randomized controlled trial designs, quasi experiments, and non-rendomized control trials. Studies that met the criteria discussed applying mindfulness to positive birth outcomes. Of the 6 studies , studies came from Canada, Egypt, Amsterdam, Netherlands, San Francisco, United States of America.

Based on 6 articles discussing the effectiveness of *mindfulness* interventions on *neonatal outcomes*. Articles that discuss *mindfulness* of *neonatal outcome* consist of several countries, namely Canada, Egypt, Amsterdam, Netherlands, San Francisco, United States of America. The results of the analysis of these 6 articles reported that *mindfulness* is effective in improving labor outcomes and has a positive impact on the baby[10]–[15].

Table 1. Article Extraction

Title	Author (Year), Country	Research Methods	Population	Mindfulness Intervention (Type, Duration, Session Length)	Research Instruments	Results
Effects of *Mindfulness*-Based Cognitive Therapy in Pregnancy on Psychological Distress and Gestational Age: Outcomes of a Randomized Controlled Trial	MacKinnon., *et al* (2021) Canada	Randomized Controlled Trial	60 pregnant women with a gestational age of 12 to 28 weeks	*Mindfulness* Based Cognitive Therapy 8 sessions Session length: 2 hours weekly given in groups of 3-6 people	• Initial assessment questionnaire • Distress thermometer • The Pregnancy Related Anxiety (PRA) • Generalized Anxiety Disorder (GAD-7) • Perceived Stress Scale (PSS)	Birth Outcomes: the results showed a significant difference in the type of delivery, where women in the MBCT-PD intervention group had more vaginal deliveries (90.5%) and fewer cesarean delivery (40.9%)
Effects of Virtual *Mindfulness* Training Program on Pregnant Women's Anxiety and Labor Outcomes during the COVID-19 Pandemic	Nasr.,*et al* (2022), Egypt	A Quasi Experimental	Each participant consisted of 41 pregnant women	Virtual *mindfulness* It consists of two theoretical sessions and six practical sessions. Session Length: each session lasted about 30 minutes and was conducted twice a week by the researchers	• Structured interview questionnaire • Pregnancy-Related anxiety questionnaire - revised-2 (PRAQ-R2) • Five Facet *Mindfulness* Questionnaire (FFMQ)	The results showed significant differences in levels of anxiety, the five aspects of attention between the groups after Implementation. There are differences regarding complications during childbirth, problems neonatal health

Fear of childbirth, nonurgent obstetric interventions, and newborn outcomes: A Randomized Controlled Trial comparing *mindfulness*- based childbirth and parenting with enhanced care as usual	Veringa-Skiba.,*et al* (2021), Amsterdam	Randomized Controlled Trial	141 pregnant women with fear of giving birth along with their partners	Mindfulness Based Childbirth And Parenting Duration : 9 weeks Length: lasts 3 hours	• Wijma Delivery Expectation Questionnaire (W-DEQ-A) • DSM-5 Perinatal Anxiety Disorder Labor (DSM-5 PAD-L • Catastrophizing Labor Pain (CLP dan Labor Pain Acceptance Questionnaire (LPAQ)	The newborn's 1-minute Apgar scores were higher on the MBCP than on the ECAU but there was no significant difference in the 5-minute Apgar scores
Mindfulness skills during pregnancy: Prospective associations with mother's mood and neonatal birth weight	Truijens SEM., *et al* (2018) Netherland	the longitudinal cohort HAPPY study	905 pregnant women at 12 weeks' gestation	Mindfulness skills Acting with Awareness and Nonjudging	• Three Facet *Mindfulness*-Questionnaire-Short Form (TFMQ-SF) • Edinburgh Depression Scale (EDS)	Regarding obstetric medical records, only Nonreacting was (positively) related to birth weight (Beta = 0.09, p <0.01). Controlling for gestational age, gender, parity, depressive symptoms, and health behaviors, Nonreacting predicted weight normal birth (OR = 1.12, 95% CI = 1.06–1.19)
Study protocol of guided mobile-based perinatal *mindfulness* intervention (GMBPMI) - a randomized controlled trial	Leng LL., *et al* (2022) San Fransisco	randomized controlled trial	Chinese pregnant women aged 18 and over in the second trimester (between 12 and 28 weeks of gestation)	Guided Mobile-Based Perinatal Mindfulness Intervention (GMBPMI) Session Length: 8 weeks Duration: 30-60 minutes	• Perceived Stress Scale • Prenatal Distress Questionnaire • Edinburgh Postnatal Depression Scale Chinese • Short-form Five Facet *Mindfulness* Questionnaire • Daily Mindful Responding Scale • Prenatal Coping Inventory • Short-form State subscale of the State-Trait Anxiety Inventory	The results of the study proved that GMBPMI's understanding of HRV and psychological well-being for pregnant women increased, with extended support both in the pre- and postnatal period

Maternal *mindfulness* during pregnancy predicts newborn neurobehavior	Olavson K., *et al* (2021) Amerika serikat	162 pregnant women aged 18 and 40 years, single fetus, did not consume illicit substances during pregnancy, no pregnancy complications	Maternal *mindfulness*	• The Mindful Attention Awareness Scale • The DERS 36-item questionnaire • NICU Network Neurobehavioral Scale	The results show that a mother's attention during pregnancy can affect the neurobehavioral development of her fetus in ways that are proven at birth. Pregnant women who practice mindfulness report lower levels of emotional dysregulation. Newborns of very caring mothers show higher levels of arousal (eg, excitability, motor activity)

The results of this systematic study describe that mindfulness interventions have a good impact on birth outcomes, reducing births by cesarean section, increasing Apgar scores in the first 1 minute, reducing complications during childbirth and neonatal health problems, having an indirect impact on extending gestational age. One article stated that there was no significant difference in gestational age, but in bivariate analysis it was stated that there was a significant difference[10], [11], [15].

Mindfulness has the potential or impact birth outcomes such as the type of labor and gestational age. Fewer cesarean deliveries among women randomized to mindfulness-based cognitive therapy interventions reflect the effect of treatment on increased self-efficacy in overcoming and reducing fear of childbirth [16]. This finding is very important considering that prenatal anxiety increases the risk of cesarean section which is associated with several adverse maternal and infant health outcomes in the short and long term[17]. Term gestational age is very important because preterm birth is associated with a number of infant health and developmental outcomes[18].

The impact of engaging in mindfulness and yoga interventions on birth out comes and maternal health should be consistent. Mindfulness interventions performed regularly in the antenatal period can significantly improve birth outcomes for pregnant women and babies. Improved birth outcomes for infants include increased birth weight due to reduced intrauterine restrictions and preterm delivery[19].

Mindfulness practices promote effective parenting behaviors such as correctly discriminating the child's cues, a sense of parenting self-efficacy, appreciation of the child's nature, and being responsive to the child's needs and emotions [20]. Increased positive influence on the mother makes her more sensitive to her baby, because the range of thoughts and actions that occur in the mother's mind is wider in such circumstances. The converse is that with more stress coupled with less positive influences, the mother's sensitivity will decrease, potentially causing more problems with self-regulation and communication for the baby. Therefore, thet importance of positive affect explains that it can coexist with adversity and serves as a restorative resource to support adaptive coping with stress [21]–[23].

Newborns in mothers who took mindfulness before birth tended to be more aroused at birth. On the surface, this pattern of reactivity appears in consistent with attention-behavior correlations. However, it is possible that newborns of highly caring mothers display behaviors that demonstrate acute sensitivity to their environment and may spend more time actively engaged with the parenting context [24].

Informed yoga interventions on mindfulnes in pregnancy. With regard to general health in pregnancy, yoga integrated with meditation interventions has been shown to improve maternal physical health in pregnancy and improve labor and birth outcomes [25].

Mindfulness has the ability to reduce the incidence of postpartum depression, stress and anxiety through the use of mindfulness-based cognitive therapy which lowers cortisol levels and women who are not treated for depression during the perinatal period suffer from

postpartum depression which harms the early development of the mother-child relationship has the ability to relieve the anxiety of the woman holding him. Due to the synergistic relationship between mother and child, mindfulness has positive effects [26]. Not to be confused with maternal neuroplasticity has been shown or have the potential to improve birth outcomes for women and babies. Improved birth outcomes for infants include increased birth weight, as a result of decreased incidence of intrauterine growth restriction and preterm birth [27].

The impact of mindfulness and yoga practice on birth outcomes and maternal health reveals findings consistent with those presented here. In particular, the studies mentioned show that mindfulness and yoga practiced regularly in the antenatal period can significantly improve birth outcomes for pregnant women and babies. Improved birth outcomes for infants include increased birth weight due to decreased incidence of intrauterine growth restriction and preterm birth [28], [29].

CONCLUSION

Having a positive experience during childbirth is a must for pregnant women. Interventions to make childbirth enjoyable is important. *Mindfulness* interventions are effective for improving delivery outcomes for both mother and baby and increasing comfort during labour. *Mindfulness* intervention mechanisms have the potential to enhance positive experiences in labor by enhancing skills for emotional regulation. *Mindfulness* in the future can be used as a non-pharmacological intervention option to reduce labor pain. Future researchers can conduct long-term research after delivery.

ACKNOWLEDGMENT

I would like to thank all parties involved for the smooth and successful writing of this article.

DAFTAR PUSTAKA

[1] M. Isgut, A. K. Smith, E. S. Reimann, O. Kucuk, and J. Ryan, "The impact of psychological distress during pregnancy on the developing fetus: Biological mechanisms and the potential benefits of mindfulness interventions," *Journal of Perinatal Medicine*, vol. 45, no. 9. Walter de Gruyter GmbH, pp. 999–1011, Dec. 20, 2017, doi: 10.1515/jpm-2016-0189

[2] J. Eastwood, F. A. Ogbo, A. Hendry, J. Noble, and A. Page, "The Impact of Antenatal Depression on Perinatal Outcomes in Australian Women," *PLoS One*, vol. 12, no. 1, p. e0169907, Jan. 2017, doi: 10.1371/JOURNAL.PONE.0169907

[3] D. J. P. Barker, "The fetal origins of adult disease : No longer just a hypothesis and may be critically important in south Asia," *BMJ Br. Med. J.*, vol. 322, no. 7283, p. 375, Feb. 2001, doi: 10.1136/BMJ.322.7283.375

[4] E. Netsi, R. M. Pearson, L. Murray, P. Cooper, M. G. Craske, and A. Stein, "Association of Persistent and Severe Postnatal Depression With Child Outcomes," *JAMA Psychiatry*, vol. 75, no. 3, pp. 247–253, Mar. 2018, doi: 10.1001/JAMAPSYCHIATRY.2017.4363

[5] A. Stein *et al.*, "Effects of perinatal mental disorders on the fetus and child," *Lancet*, vol. 384, no. 9956, pp. 1800–1819, Nov. 2014, doi: 10.1016/S0140-6736(14)61277-0

[6] J. Kabat-Zinn, *Full Catastophe Living*. 2005

[7] C. Vieten *et al.*, "The mindful moms training: Development of a mindfulness-based intervention to reduce stress and overeating during pregnancy," *BMC Pregnancy Childbirth*, vol. 18, no. 1, Jun. 2018, doi: 10.1186/S12884-018-1757-6

[8] E. Epel, J. Daubenmier, J. T. Moskowitz, S.

Folkman, and E. Blackburn, "Can meditation slow rate of cellular aging? Cognitive stress, mindfulness, and telomeres," *Ann. N. Y. Acad. Sci.*, vol. 1172, pp. 34–53, 2009, doi: 10.1111/J.1749-6632.2009.04414.X

[9] S. G. Hofmann, A. T. Sawyer, A. A. Witt, and D. Oh, "The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review," *J. Consult. Clin. Psychol.*, vol. 78, no. 2, pp. 169–183, Apr. 2010, doi: 10.1037/A0018555

[10] A. L. MacKinnon *et al.*, "Effects of Mindfulness-Based Cognitive Therapy in Pregnancy on Psychological Distress and Gestational Age: Outcomes of a Randomized Controlled Trial," *Mindfulness (N. Y).*, vol. 12, no. 5, pp. 1173–1184, 2021, doi: 10.1007/s12671-020-01585-2

[11] E. S. G. Nasr, A. S. Eldesokey Genedy, N. E. Osman, R. M. Abdelmonem, and A. I. Emara, "Effects of Virtual Mindfulness Training Program on Pregnant Women's Anxiety and Labor Outcomes during the COVID-19 Pandemic.," *Assiut Sci. Nurs. J.*, vol. 10, no. 28, pp. 80–93, Jan. 2022, doi: 10.21608/ASNJ.2022.113572.1290

[12] S. M. Ng *et al.*, "Study protocol of guided mobile-based perinatal mindfulness intervention (GMBPMI) - a randomized controlled trial," *PLoS One*, vol. 17, no. 7 July, Jul. 2022, doi: 10.1371/JOURNAL.PONE.0270683

[13] I. Nyklíček, S. E. M. Truijens, V. Spek, and V. J. M. Pop, "Mindfulness skills during pregnancy: Prospective associations with mother's mood and neonatal birth weight," *J. Psychosom. Res.*, vol. 107, pp. 14–19, Apr. 2018, doi: 10.1016/j.jpsychores.2018.01.012

[14] B. D. Ostlund *et al.*, "Maternal mindfulness during pregnancy predicts newborn neurobehavior," *Dev. Psychobiol.*, vol. 63, no. 6, p. e22131, Sep. 2021, doi: 10.1002/DEV.22131

[15] I. K. Veringa-Skiba, E. I. de Bruin, F. J. A. van Steensel, and S. M. Bögels, "Fear of childbirth, nonurgent obstetric interventions, and newborn outcomes: A randomized controlled trial comparing mindfulness-based childbirth and parenting with enhanced care as usual," *Birth*, 2021, doi: 10.1111/BIRT.12571

[16] J. Byrne, Y. Hauck, C. Fisher, S. Bayes, and R. Schutze, "Effectiveness of a Mindfulness-Based Childbirth Education Pilot Study on Maternal Self-Efficacy and Fear of Childbirth," *J. Midwifery Womens. Health*, vol. 59, no. 2, pp. 192–197, Mar. 2014, doi: 10.1111/JMWH.12075

[17] M. Landon *et al.*, "Gabbe's Obstetrics Essentials: Normal & Problem Pregnancies," *Gabbe's Obstet. Essentials Norm. Probl. Pregnancies*, 2019

[18] J. L. Cheong *et al.*, "Association Between Moderate and Late Preterm Birth and Neurodevelopment and Social-Emotional Development at Age 2 Years," *JAMA Pediatr.*, vol. 171, no. 4, pp. e164805–e164805, Apr. 2017, doi: 10.1001/JAMAPEDIATRICS.2016.4805

[19] M. I. van den Heuvel, M. A. Johannes, J. Henrichs, and B. R. H. Van den Bergh, "Maternal mindfulness during pregnancy and infant socio-emotional development and temperament: The mediating role of maternal anxiety," *Early Hum. Dev.*, vol. 91, no. 2, pp. 103–108, Feb. 2015, doi: 10.1016/J.EARLHUMDEV.2014.12.003

[20] M. I. van den Heuvel, F. C. L. Donkers, I. Winkler, R. A. Otte, and B. R. H. Van den Bergh, "Maternal mindfulness and anxiety during pregnancy affect infants neural responses to sounds," *Soc. Cogn. Affect. Neurosci.*, vol. 10, no. 3, pp. 453–460, Sep. 2013, doi: 10.1093/scan/nsu075

[21] S. Folkman and J. T. Moskowitz, "Positive affect and the other side of coping," *Am.*

Psychol., vol. *55*, no. 6, pp. 647–654, 2000, doi: 10.1037/0003-066X.55.6.647

[22] B. L. Fredrickson, "The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions," *Am. Psychol.*, vol. 56, no. 3, pp. 218–226, 2001, doi: 10.1037/0003-066X.56.3.218

[23] C. L. Smith and A. Stephens, "Maternal Stress and Sensitivity: Moderating Effect of Positive Affect," *https://doi.org/10.1080/15295192.2018.1405699*, vol. 18, no. 1, pp. 1–8, 2018, doi: 10.1080/15295192.2018.1405699

[24] P. Bateson, P. Gluckman, and M. Hanson, "The biology of developmental plasticity and the Predictive Adaptive Response hypothesis," *J. Physiol.*, vol. 592, no. 11, pp. 2357–2368, Jun. 2014, doi: 10.1113/JPHYSIOL.2014.271460

[25] K. Curtis, A. Weinrib, and J. Katz, "Systematic review of yoga for pregnant women: current status and future directions," *Evid. Based. Complement. Alternat. Med.*, vol. 2012, 2012, doi: 10.1155/2012/715942

[26] A. F. Almarzouki, C. A. Brown, R. J. Brown, M. H. K. Leung, and A. K. P. Jones, "Negative expectations interfere with the analgesic effect of safety cues on pain perception by priming the cortical representation of pain in the midcingulate cortex," *PLoS One*, vol. 12, no. 6, Jun. 2017, doi: 10.1371/JOURNAL.PONE.0180006

[27] P. Van der Riet, L. Francis, and A. Rees, "Exploring the impacts of mindfulness and yoga upon childbirth outcomes and maternal health: an integrative review," *Scand. J. Caring Sci.*, vol. 34, no. 3, pp. 552–565, 2020, doi: 10.1111/scs.12762

[28] L. G. Duncan and N. Bardacke, "Mindfulness-Based Childbirth and Parenting Education: Promoting Family Mindfulness During the Perinatal Period," *J. Child Fam. Stud.*, vol. 19, no. 2, p. 190, Apr. 2010, doi: 10.1007/S10826-009-9313-7

[29] C. Dunn, E. Hanieh, R. Roberts, and R. Powrie, "Mindful pregnancy and childbirth: effects of a mindfulness-based intervention on women's psychological distress and well-being in the perinatal period," *Arch. Women's Ment. Heal. 2012 152*, vol. 15, no. 2, pp. 139–143, Mar. 2012, doi: 10.1007/S00737-012-0264-4