

A systematic mixed-studies review on mindfulness-based childbirth education programs and maternal outcomes

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ARTICLE INFO

Article history:

Received 15 February 2019

Received in revised form

29 April 2019

Accepted 15 May 2019

Available online May 17, 2019.

Keywords:

Antenatal classes

Childbirth education

Mindfulness

Mixed studies review

Maternal outcomes

ABSTRACT

Background: Mindfulness-based childbirth education programs are gaining popularity among expectant parents.

Purpose: To synthesize knowledge on current available evidence of mindfulness-based childbirth education programs on maternal outcomes and to provide recommendations to improve future mindfulness-based childbirth education programs.

Method: A mixed-studies systematic review using a narrative synthesis was conducted. Four electronic databases were searched from each database's inception, through November 26, 2018.

Findings: Three themes emerged from the synthesis: (a) the duration and receptivity of the programs, (b) improved maternal psychosocial outcomes, and (c) the practice of mindfulness during the postpartum period. A conceptual map was produced.

Discussion: The programs resulted in improved maternal psychosocial outcomes. A greater focus on the practice of informal mindfulness should be taught in future mindfulness-based childbirth education programs. Nurses can consider teaching mindfulness techniques in current antenatal classes. The cost effectiveness and receptivity of the programs should be examined. Future mixed-methods longitudinal studies with ideal sample sizes and the exclusion of participants with prior yoga or medication experiences should be conducted.

Cite this article: Shorey, S., Ang, L., & Chee, C.Y.I. (2019, November/December). A systematic mixed-studies review on mindfulness-based childbirth education programs and maternal outcomes. *Nurs Outlook*, 67(6), 696–706. <https://doi.org/10.1016/j.outlook.2019.05.004>.

Introduction

Mindfulness-based interventions (MBIs) have been known to be widely used as a therapy to cope with stress and a variety of mental illnesses. Recently, MBIs have

been incorporated into childbirth and parenting antenatal classes whereby mindfulness skills are taught in combination with childbirth and parenting skills to expectant couples. These specific MBIs for expectant couples are known as “Mindfulness-Based Childbirth and Parenting” (MBCP) and “Mindfulness-Based

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<https://doi.org/10.1016/j.outlook.2019.05.004>

Childbirth Education” (MBCE). There is a need to consolidate current available evidence of MBCE programs on maternal outcomes.

Antenatal childbirth education for expectant parents has been in place for a long time. However, expectant mothers not only expressed the need for adequate psychological and instrumental support, but also yearned for information during this difficult transitional period (Ong et al., 2014; Slomian et al., 2017). Antenatal childbirth education aims to provide sufficient information and strategies to expectant parents to support pregnancy, childbirth, and parenthood (Ahldén, Ahlehagen, Dahlgren, & Josefsson, 2012). Women’s confidence regarding childbirth can also be increased when information on pain and pain relief during childbirth is provided during antenatal childbirth education (Hauck, Fisher, Byrne, & Bayes, 2016). Childbirth education is described by Lothian (2008) to be at a crossroads as there are varied educational programs available for expectant parents to choose from, such as the Bradley method, the Lamaze method, the International Childbirth Educators Association, hypnobirthing (the Mongan method), Birthing From Within, MBCP, and MBCE (Walker, Visger, & Rossie, 2009). Early childbirth education models were the Bradley method, the Lamaze method, and the International Childbirth Educators Association. The Bradley method, which is also known as the “husband-coached natural childbirth model,” was designed by Robert A. Bradley, who was an obstetrician/gynaecologist, to prepare expectant parents for birth in a natural way (Walker et al., 2009). The Lamaze method was introduced in 1951 by a French obstetrician named Fernand Lamaze, which consisted of childbirth education, relaxation, and breathing techniques (Walker et al., 2009). The ICEA originated from an evolution of childbirth class from Lamaze’s curriculum that was taught in hospitals; ICEA-certified childbirth educators used a variety of childbirth education models such as the Lamaze and Bradley methods to teach expectant parents how to cope with labour.

Emerging models of childbirth education include hypnobirthing, Birthing from Within, and MBCE models such as MBCP and MBCE (Walker et al., 2009). Hypnobirthing was started by Marie Mongan in 1990 to help expectant parents frame birth expectations and experiences in a positive manner using hypnosis techniques. Birthing from Within was developed by Pam England in 1999 in which expectant parents learn about the experiences of their upcoming labour from the mother’s point of view so that they will take responsibility for protecting the birth space and are at less risk of becoming intimidated by the unknown.

The concept of mindfulness originated from Buddhist teachings in the ancient East, which has been in existence in the Eastern Buddhist realms for 2,500 years (Schmidt, 2011). Mindfulness was introduced into the modern Western culture, often in a secularised version, in the recent 20 to 30 years in the realm of behavioural medicine and art therapy

(Schmidt, 2011). It is argued that the concept of mindfulness should be examined in relation to its cultural context where it has been practiced as mindfulness in connection with history, social, and religion in certain societies (Kirmayer, 2015). Mindfulness, as defined by Kabat-Zinn (2005), is awareness that arises from purposefully and nonjudgmentally paying attention to the present moment. The focus in mindfulness is developing the capacity to observe changing mental and physiological states without modifying them and achieving a desired relaxed or calm state of mind (Vieten & Astin, 2008). Several mindfulness-based programs have been categorized under the broad umbrella of MBIs. The different programs of MBIs that have been studied include mindfulness-based cognitive therapy (MBCT), mindfulness-based stress reduction (MBSR), integrated mindfulness yoga (Shi & MacBeth, 2017), MBCP (Duncan & Bardacke, 2010; Duncan et al., 2017; Malis, Meyer, & Gross, 2017), MBCE (Byrne, Hauck, Fisher, Bayes, & Schutze, 2014; Fisher, Hauck, Bayes, & Byrne, 2012), mindfulness- and acceptance-based group therapy (Kocovski, Fleming, & Rector, 2009), and acceptance and commitment therapy (Hayes, Strosahl, & Wilson, 2003). Various MBIs have been tested for their efficacy on outcomes such as chronic pain relief (Chiesa & Serretti, 2011), improving maternal mental health (Shi & MacBeth, 2017), and coping with psychological distress (Carmody & Baer, 2009). An MBCT program was designed to help avoid relapse into clinical depression (Morgan, 2003). An MBSR program was developed by Kabat-Zinn (1996) to help minimize stress and cope with illnesses. The MBSR program had been studied regarding whether it helped to relieve pain from chronic illnesses such as fibromyalgia (Kaplan, Goldenberg, & Galvin-Nadeau, 1993) and rheumatoid arthritis (Pradhan et al., 2007).

MBCP is an emerging childbirth education program developed by Bardacke (2018) that has gained popularity in recent years (Hughes et al., 2009; Walker et al., 2009; Warriner, Williams, Bardacke, & Dymond, 2012). This program incorporates the mindfulness technique of Kabat-Zinn (2005) and childbirth education such as providing information on labour, breastfeeding, and postpartum care (Latendresse, 2013). An important component of MBCP requires women and their partners to practice meditation, yoga, and mindfulness in their daily lives (Walker et al., 2009). MBCP is a set curriculum to support new parents across the perinatal period with four intentions: (a) teaching parents mindfulness meditation for decreasing stress during pregnancy, (b) offering parents mindfulness skills for dealing with the pain and fear of childbirth, (c) encouraging mindfulness skills in parents, such as wisdom, kindness, and connection for parenting from the moment of their children’s births, and (d) it must be taught by professionals who are trained in mindfulness practice. The MBCE protocol was developed specifically by Fisher et al. (2012) and Byrne et al. (2014) whereby mindfulness meditation is taught with skill-based childbirth education. The MBCT and MBSR

programs focus on enhancing the well-being and interest of human life in general (Kabat-Zinn, 2005) whereas the MBCP and MBCE programs focus on enhancing the well-being of mothers by reducing stress, anxiety, and pain related to pregnancy, childbirth, or parenting through the practice of mindfulness meditation during the perinatal period (Bardacke, 2018; Byrne et al., 2014; Fisher et al., 2012).

Rigorous systematic reviews have been conducted on the efficacy of various MBIs on childbirth education by measuring maternal mental health outcomes during the perinatal period (Dhillon, Sparkes, & Duarte, 2017; Hall, Beattie, Lau, East, & Anne Biro, 2016; Shi & MacBeth, 2017; Taylor, Cavanagh, & Strauss, 2016). The reviews included studies that utilized any form of mindfulness-based program such as MBCT, MBSR, and Mindfulness and Acceptance-based Group Therapy as childbirth education, and they evaluated the efficacy of the programs on maternal mental health outcomes. However, there has been no review that examined the efficacy of the recently developed MBCP and MBCE programs that were specifically designed for pregnancy, childbirth, and parenting. It is important to summarize the current evidence of these two mindfulness-based educational programs for pregnancy, childbirth, and parenting as there is an increasing focus on evidence-based practice in the nursing field, particularly in childbirth education (Koehn, 2002) and in the antenatal period (Browne, O'Brien, Taylor, Bowman, & Davis, 2014), where clinical research plays a crucial role in guiding current nursing practices. The findings from this review will pave the way for future research and clinical implications in the field of childbirth education for expectant parents.

Methods

Aim

This mixed studies review aims to synthesize knowledge on the current available evidence of MBCE programs on maternal outcomes and to provide recommendations to improve future MBCE programs.

Design

This review utilized Popay et al. (2006) approach of narrative synthesis because its framework was best suited to preliminarily synthesize current evidence of novel programs such as MBCE programs. Additionally, Popay et al. (2006) approach of narrative synthesis was best suited to guide this review as the broad review aim required the inclusion of a wide range of research designs, that is, qualitative, quantitative, and mixed methods studies. Four elements were delineated in this method of narrative synthesis: (a) developing a theory, (b) developing a preliminary synthesis, (c) exploring relationships within and between studies,

and (d) assessing the robustness of the synthesis. However, it is important to note that these are not stages as a narrative synthesis is an iterative process (Popay et al., 2006). Theory development was not conducted in this review due to the exploratory nature of the topic synthesized. Therefore, only three of the four elements were followed in this review: (a) developing a preliminary synthesis, (b) exploring relationships within and between studies, and (c) assessing the robustness of the synthesis.

A preliminary synthesis was conducted through the extraction of descriptive characteristics from the included studies. The relationships between and within the included studies were explored using a thematic analysis where analytical themes were generated. The robustness of the synthesis process was assessed in the conclusion by the strengths and limitations of the evidence synthesized.

Search Methods

A literature search was conducted in four electronic databases: PubMed, PsycINFO, Scopus, and CINAHL from the inception of each database to 26 November, 2018. These four electronic databases were decided based on the reviewers' (S.S. and C.C.) areas of expertise in maternal and child health and the databases searched in previous systematic reviews on using MBIs as childbirth education programs (Hall et al., 2016; Shi & MacBeth, 2017). Potential studies were searched by their titles and abstracts using varied unique combinations of keywords and search terms such as mind, mindful, mindfulness-based, birth, childbirth, labour, parturition, parenting, child rearing, antenatal, perinatal, pregnant, prenatal, intervention, program, training, therapy, education, educational program, models, and class in the different databases. The search strategy for the four databases is detailed in Table A1 (supplementary file). Potential studies were screened by their titles and abstracts according to the inclusion and exclusion criteria (Table 1).

Quality Appraisal

The Joanna Briggs Institute's Critical Appraisal Tool (2014) was used to appraise the methodological quality of the eight included studies. The methodological quality of the qualitative component was evaluated through the Checklist for Qualitative Research. The quantitative component of the included studies was appraised using the Joanna Briggs Institute's Critical Appraisal Checklists for Randomized Controlled Trials or the Checklist for Analytical Cross Sectional Studies (Joanna Briggs Institute, 2014). Quality assessment was examined by two independent reviewers (S.S. and L.A.), and all discrepancies that arose were resolved through discussion between the reviewers and consulting the third reviewer (C.C.) to reach a final decision. Qualitative component was assessed for congruency of the following: paradigm, methodology

Table 1 – Inclusion and Exclusion Criteria

Parameters	Inclusion Criteria	Exclusion Criteria
Type of programs	<ul style="list-style-type: none"> Studies that used the MBCP or MBCE programme as antenatal childbirth education 	<ul style="list-style-type: none"> Studies that employed varied forms of MBIs such as MBCT or MBSR as childbirth education programs other than the MBCP and MBCE programs
Outcomes	<ul style="list-style-type: none"> Studies that examined maternal-related outcomes 	<ul style="list-style-type: none"> Studies that did not examine maternal-related outcomes
Study design	<ul style="list-style-type: none"> Studies that utilised qualitative and/or quantitative research designs 	<ul style="list-style-type: none"> Studies that did not utilise qualitative and/or quantitative research designs
Language	<ul style="list-style-type: none"> Peer-reviewed studies published in English 	<ul style="list-style-type: none"> Studies that were not peer-reviewed and/or published in English

Note. MBCE, mindfulness-based childbirth education; MBCP, mindfulness-based childbirth and parenting; MBCT, mindfulness-based cognitive therapy; MBI, mindfulness-based intervention; MBSR, mindfulness-based stress reduction.

and method, researchers' bias, collection of data, and analysis of data. Quantitative component was evaluated for the sample, design, reliability, and validity of the measurement tools, the identification and resolution of confounding factors, selection bias, reporting bias, and statistical analysis.

Data Extraction and Synthesis

A preliminary synthesis was developed through the extraction of descriptive characteristics from the included studies into a table whereby a textual summary of the results of each study was produced. The following information was extracted from the included studies: study's characteristics, participants' characteristics, information on the programme, participants' attendance rate, study outcomes, and main findings of the study.

A thematic analysis was conducted in three stages by two independent reviewers (S.S. and L.A.): inductive coding of the text, development of descriptive themes, and generation of analytical themes. Line-by-line inductive coding of the included studies was conducted to identify patterns across the studies. The descriptive themes were drawn out through a summary of the inductive codes into similar categories or patterns. The descriptive themes were then collapsed to form analytical themes through a process of rereading and comparing evidence among the included studies. Analytical themes were finalized when a consensus was reached after a discussion was held among the independent reviewers. The third reviewer (C.C.) was invited to resolve any discrepancies that occurred throughout the process. A conceptual map was produced to provide a visual representation of the state of knowledge of the current MBCE programs and recommendations for future programs.

Findings

Search Outcomes

The initial search from the four electronic databases yielded 656 records of interest. Specifically, 189 were

identified from PubMed, 168 from PsycINFO, 253 from Scopus, and 46 from CINAHL. After removing duplicates, 541 records remained. These records were screened for relevance by their titles and abstracts, and 508 were excluded because they were either irrelevant to the topic of interest or did not meet the inclusion criteria. The full texts of the remaining 33 studies were downloaded and reviewed. Additionally, the reference lists of the 33 studies were checked to confirm if any relevant studies could be included. Backward citation tracking did not result in any additional relevant studies. An additional 25 records were excluded as they were either a protocol ($n = 1$), not utilizing the MBCP or MBCE programme ($n = 14$), theses ($n = 2$), not research studies ($n = 5$), or review papers ($n = 3$). Subsequent to an independent review by two of the authors (S.S. and L.A.), eight peer-reviewed studies (Byrne et al., 2014; Duncan & Bardacke, 2010; Duncan et al., 2017; Fisher et al., 2012; Kantrowitz-Gordon, Abbott, & Hoehn, 2018; Malis et al., 2017; Pan et al., 2018; Warriner, Crane, Dymond, & Krusche, 2018) were included in this review. Figure 1 illustrates the Preferred Reporting Item for the Systematic Reviews and Meta-analyses flow diagram (Moher, Liberati, Tetzlaff, Altman, & Group, 2009).

Study Characteristics

The eight peer-reviewed studies included diverse methodological designs that utilised quantitative ($n = 4$), qualitative ($n = 3$), and mixed-method ($n = 1$) methodologies. Two were randomized controlled trials (Duncan et al., 2017; Pan et al., 2018) and two were cross-sectional studies (Byrne et al., 2014; Warriner et al., 2018). The qualitative studies used the generic qualitative approach (Fisher et al., 2012), semi-structured interviews (Kantrowitz-Gordon et al., 2018), and the phenomenological approach (Malis et al., 2017) in guiding the studies. The mixed-method pilot study (Duncan & Bardacke, 2010) utilized the pretest–posttest design using four cohorts and qualitative descriptions using a phenomenological approach. The settings of the included studies varied in countries, with three studies conducted in the United States (Duncan

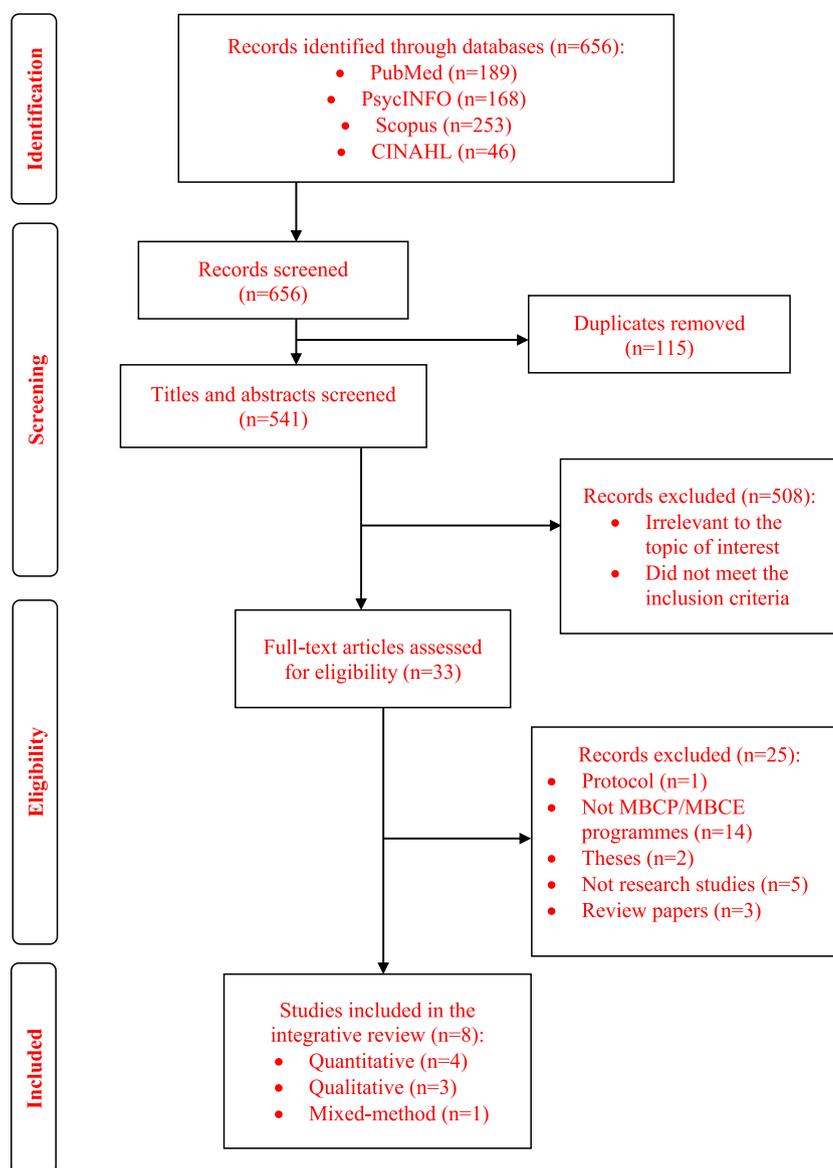


Figure 1 – Preferred reporting items for systematic reviews and meta-analyses flow diagram.

& Bardacke, 2010; Duncan et al., 2017; Kantrowitz-Gordon et al., 2018), two studies of similar programs conducted in Australia (Byrne et al., 2014; Fisher et al., 2012), one study conducted in Switzerland (Malis et al., 2017), one study conducted in England (Warriner et al., 2018), and the only Asian study conducted in Taiwan (Pan et al., 2018).

Two programs (MBCE and MBCP) were included in this review. Two studies examined the MBCE program; however, they were the qualitative (Fisher et al., 2012) and quantitative (Byrne et al., 2014) components of the same intervention. The remaining six studies (Duncan & Bardacke, 2010; Duncan et al., 2017; Kantrowitz-Gordon et al., 2018; Malis et al., 2017; Pan et al., 2018; Warriner et al., 2018) examined the MBCP program. Both MBCE and MBCP programs were conducted by professionals who were trained in mindfulness practice in all of the included studies. The total sample size in the eight included studies was 257, with

10 being the smallest sample size (Malis et al., 2017) and 104 being the largest sample size (Pan et al., 2018). Three of the studies (Duncan & Bardacke, 2010; Duncan et al., 2017; Malis et al., 2017) indicated that participants with prior yoga or meditation experiences were included in the study. In addition, Duncan and Bardacke's (2010) study also included participants who experienced major stressful life events during their pregnancies. A summary of the included studies is presented in Table A2 (supplementary file).

Methodological Quality

Generally, the included studies were of good quality as the methodological strengths surpassed the methodological limitations. The common methodological limitation in the qualitative studies was the lack of information about the role of the researcher. For cross-sectional pilot studies, the common limitations

were the small sample sizes and the exclusion of confounding factors in the data analysis. Methodological quality was not used in the inclusion or exclusion of studies in this review. However, the methodological limitations of the studies were discussed in relation to the potential impact of the interpretation of these reviews' findings. The assessment of the methodological quality of the included studies is detailed in Table A3 (supplementary file).

Duration and Receptivity of the Programs

The durations of the programs in the included studies lasted about 8 weeks on average, with each session having a 2.5 or 3 hr duration each week. The longest program lasted 9 weeks, with a 3 hr duration for each session and one extra class during the postpartum period (Duncan & Bardacke, 2010; Kantrowitz-Gordon et al., 2018). The shortest program lasted 2.5 days, a total of 18 hr (Duncan et al., 2017). Seven studies included the practice of daily mindfulness meditation as homework for participants to practice at home. Six studies (Byrne et al., 2014; Duncan & Bardacke, 2010; Duncan et al., 2017; Fisher et al., 2012; Pan et al., 2018; Warriner et al., 2018) reported more than 80% attendance rates. However, one study did not provide any information on their attendance rate (Kantrowitz-Gordon et al., 2018). Two studies of similar programs reported that adherence to daily meditation homework was low (Byrne et al., 2014; Fisher et al., 2012). The remaining four studies did not report their rates of adherence to daily mindfulness meditation homework.

Improved Maternal Psychosocial Outcomes

The programs in the included studies were found to improve maternal psychosocial outcomes. From the quantitative studies, significant improvements in psychological outcomes such as stress, anxiety, depression, mindfulness, and childbirth self-efficacy were found in most studies after participants attended the programs. Three quantitative studies found significant improvements in maternal stress (Byrne et al., 2014; Pan et al., 2018; Warriner et al., 2018), three studies found significant improvements in maternal anxiety (Byrne et al., 2014; Duncan & Bardacke, 2010; Warriner et al., 2018), four studies found significant improvements in maternal depression at post-intervention (Duncan & Bardacke, 2010; Duncan et al., 2017; Pan et al., 2018; Warriner et al., 2018), three studies found significant improvements in mindfulness postintervention (Duncan & Bardacke, 2010; Pan et al., 2018; Warriner et al., 2018), and three studies found significant improvements in childbirth self-efficacy (Byrne et al., 2014; Duncan et al., 2017; Pan et al., 2018).

From the qualitative studies, social outcomes such as fostering a sense of community among like-minded parents and developing positive relationships with partners and infants were found. One of the participants explained how she was empowered through

attending the program, which resulted in her confident labour process: "I think my expectations changed throughout the course as well... My expectations upon myself to have a labour and deliver this baby, you know, feeling very empowered. So, it was really great to see... as we went along and just the confidence, I think, has grown in the group and by the end of it, [MBCE], everyone was like 'Yes, you can do this...'" (Fisher et al., 2012, pp. 3–4). Participants reported that the programs helped foster a sense of community among like-minded parents. One participant shared how she benefited from the MBCE programme: "I loved hearing other people talking and challenging concepts, and I think I got the most out of that, just the group interaction and participation. Yeah, it was really good" (Fisher et al., 2012, p. 8). Additionally, two studies found that the practice of mindfulness helped participants to develop positive relationships with their partners and infants. Mothers reported feelings of compassion and connectedness to their partners: "It was really good for reminding me about, uh, compassion towards my partner, towards my husband... [who is] probably more scared about being a parent than I am..." (Kantrowitz-Gordon et al., 2018, p. 467) and "I felt very connected to my partner. The class taught us how to work as a team and be fully present in the moment..." (Duncan & Bardacke, 2010, p. 198). One mother shared her joyful relationship with her infant through the use of mindfulness: "Being with [the] baby and breastfeeding and, like, staring into her eyes, like, when I wasn't crying because I was so moved, I was laughing... because she was so awesome... It [mindfulness] just magnified the joy that we felt" (Kantrowitz-Gordon et al., 2018, pp. 466–467).

Practice of Mindfulness During the Postpartum Period

Significant improvements in maternal stress, anxiety, and depression persisted at the follow-up stage during the postpartum period in two quantitative studies (Byrne et al., 2014; Duncan et al., 2017). The reductions in maternal stress, anxiety, and depression in the postpartum period could be explained through the qualitative studies.

Qualitative studies also revealed that mothers found it challenging to practice mindfulness during the postpartum period and that informal mindfulness was more commonly practiced compared to formal mindfulness (Fisher et al., 2012; Malis et al., 2017). The practice of mindfulness in general helped mothers to cope with stressful, unpleasant, or depressing situations through accepting these situations. Mothers expressed the benefits of practicing informal mindfulness: "And in [the] postpartum, I have tried to use the practice to deal with stressful situations whether it be a crying baby or just accepting my new role as a mother who doesn't have much time for herself. Being mindful is always at the back of my mind, no matter what I am doing, even if it isn't a formal practice" (Duncan & Bardacke, 2010, p. 198), "I would probably do a little more informal practice, just paying more attention to the baby in my arms, trying to appreciate those

Table 2 – The Practice of Formal and Informal Mindfulness during the Postpartum Period

Formal mindfulness practices	<ul style="list-style-type: none"> ■ Sitting meditation ■ Body scan ■ Breath awareness ■ Mindful movement or yoga
Informal mindfulness practices	<ul style="list-style-type: none"> ■ Staying in the present moment ■ Slowing down to be in the moment ■ Experiencing positive emotions ■ Observing acceptance as a way of psychological adaptation during stressful situations ■ Practicing self-compassion or self-kindness through accepting one's current state of mind and body and tolerating the imperfection of others
Benefits of practicing mindfulness	<ul style="list-style-type: none"> ■ Ability to act out their roles as parents ■ Being active participants in decision-making ■ Staying calm and working as a team with their partners during labour ■ Facilitating their inclusion in a community of like-minded parents ■ Highly accepting of their current situations ■ A shelter to help cope with salient stressful situations
Challenges of practicing mindfulness during the postpartum period	<ul style="list-style-type: none"> ■ Less prepared for early parenting during the postpartum period compared to antenatal period ■ A challenge to practice mindfulness in difficult moments

moments even of total disgusting poop messes or whatever. Um, so, yeah, it has, it has sort of woven itself into my life in a lot in meaningful ways” (Kantrowitz-Gordon et al., 2018, p. 466), and “Now, it is in me, and I know how to do it. . . It's like a shelter. I know that I can do it and take a lot of benefits from that” (Malis et al., 2017, p. 7). Table 2 details the summary of the practice of formal and informal mindfulness during the postpartum period.

Conceptual Map on MBCE Programs

The average duration of current MBCE programs was 8 weeks long with each session lasting about 2.5 to 3 hr. Six studies reported more than 80% attendance rates, but low daily meditation homework was reported in two studies. However, these studies have small sample sizes. The programs were effective in improving maternal psychosocial outcomes. Participants in the qualitative studies reported the benefits and challenges of practicing mindfulness during the postpartum period. The practice of informal mindfulness was preferred and practiced more than formal mindfulness during the postpartum period. Only two quantitative studies had follow-up timepoints during the postpartum period. Future MBCE programs should be evaluated on the basis of cost effectiveness and receptivity using an ideal sample size. Future longitudinal studies should examine the effectiveness of the programs on maternal outcomes during the postpartum period. Lastly, a greater focus on teaching informal mindfulness should be taught during the programs as it was the preferred choice of mindfulness practice during the postpartum period. Figure 2 depicts the conceptual map on MBCE programs.

Discussion

This integrative review included eight studies with diverse methodologies that examined MBCE programs (MBCP and MBCE) that were recently designed

specifically for pregnancy, childbirth, and parenting. The narrative synthesis method by Popay et al. (2006) was used to synthesize the eight included studies of diverse methodological designs. Three of the included studies were pilot studies and had small sample sizes (Byrne et al., 2014; Duncan & Bardacke, 2010; Warriner et al., 2018). Most of the included studies were conducted in the West – United States, Australia, Switzerland, and England – and one study was conducted in Asia – Taiwan. Countries of different cultural contexts are seen to adopt mindfulness in the realm of perinatal care. However, more studies are needed to ascertain the benefits of incorporating mindfulness practices in the realm of pregnancy and childbirth. Future mixed-method studies should ascertain the effectiveness and benefits of the programs in their specific cultural contexts as mindfulness practices take on a different meaning in different societies, especially in the East (Kirmayer, 2015). Mindfulness interventions in the realm of pregnancy, childbirth, and perinatal care should be tailored according to their specific cultural contexts, taking into account the religious practices.

Three analytical themes emerged from the thematic synthesis: (a) the duration and receptivity of the programs, (b) improved maternal psychosocial outcomes, and (c) the practice of mindfulness during the postpartum period. The durations of the mindfulness-based educational programs were slightly longer than the durations of traditional antenatal education classes. Generally, traditional antenatal education classes have an average total training time of 16 hr, with 2 hr of weekly instruction spread across 8 consecutive weeks (Sercekus & Baskale, 2016). The average total training time of the mindfulness-based educational programs for pregnancy, childbirth, and parenting ranged from approximately 20 hr (Byrne et al., 2014; Fisher et al., 2012) to 34 hr (Duncan & Bardacke, 2010). The long training times required may be due to the teaching and practice of daily mindfulness meditation during the classes. Long intervention durations have been observed to yield poor attendance rates among participants in a review on the desired duration of

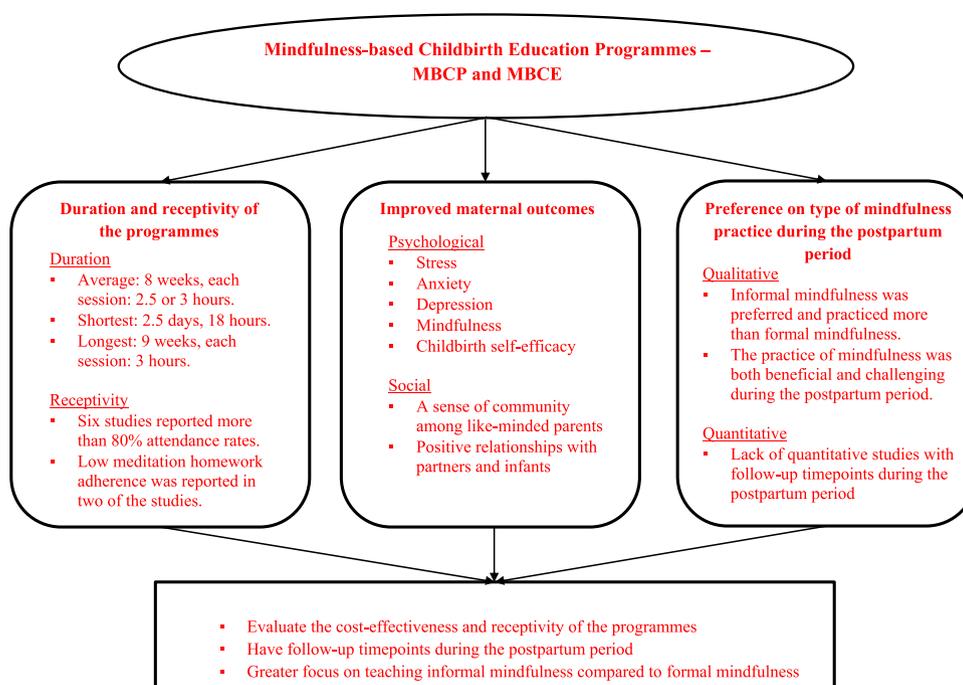


Figure 2 – Conceptual map on mindfulness-based childbirth education programs.

MBSR programs for psychological distress (Carmody & Baer, 2009). Contrary to previous literature, the attendance rates reported in this review were fairly good. However, it is important to note that the small sample sizes of some of the pilot studies in this review may have positively influenced the high attendance rates. The receptivity of MBCE programs among pregnant women needs to be further evaluated and ascertained with studies of adequate sample sizes and sufficient power (Cohen, 1988).

The MBCP and MBCE programs that were designed specifically for expectant parents were found to improve maternal psychosocial outcomes in this review. Maternal stress, anxiety, depression, mindfulness, and childbirth self-efficacy improved significantly after mothers attended the programs. Qualitative interviews revealed that the MBCE programme increased the childbirth efficacy of mothers (Byrne et al., 2014) by empowering them and their birth partners to actively participate in decision-making during childbirth (Fisher et al., 2012). Childbirth self-efficacy is associated with a variety of positive outcomes such as a high sense of coherence, reductions in negative mood states and fear of childbirth, low risks of developing mental illness during the perinatal period, and less uses of epidural analgesia during childbirth (Carlsson, Ziegert, & Nissen, 2015). Mothers reported that social support from like-minded parents was beneficial to them and positive relationships with their partners and infants were formed. Maternal postnatal depression is strongly associated with a lack of social support (Leahy–Warren, McCarthy, & Corcoran, 2012) and poor marital relationship (Clout & Brown, 2016). The programs not only equipped mothers with the skills to practice mindfulness but also provided them with social support to

buffer them against the risk of developing postnatal depression during the perinatal period. Additionally, the programs provided information and skills on childbirth and parenting for pregnant women that other MBIs did not provide. The provision of information and skills on childbirth and parenting along with mindfulness skills is important for first-time mothers who do not have prior experience and may be overwhelmed by their lack of knowledge and skills on infant care and breastfeeding, resulting in the risk of postnatal depression (Ong et al., 2014). This shows that the incorporation of antenatal childbirth classes is important in mindfulness-based educational programs, especially for first-time parents. On the other hand, a review on the effectiveness of MBIs on maternal perinatal mental health outcomes did not find a significant reduction in depression scores (Shi & MacBeth, 2017). This finding is contrary to the finding in this review, and one of the possible reasons may be the inclusion of participants with prior yoga and/or meditation experiences. Therefore, future studies should exclude participants with prior experiences in yoga and/or meditation for an accurate assessment of the effectiveness of MBCE programs.

The practice of formal and informal mindfulness during the postpartum period was reported by mothers. The benefits of formal and informal mindfulness practice allowed mothers to cope with challenging situations during the postpartum period through accepting the present stressful moment (Duncan & Bardacke, 2010; Malis et al., 2017). The practice of informal mindfulness allowed mothers to live in the present moment and adopt accepting attitudes (Mason & Hargreaves, 2001). The postpartum period was found to be stressful and hectic for first-time mothers and the presence of

social support and coping strategies to manage stressful events is important during this period (Razurel, Bruchon-Schweitzer, Dupanloup, Irion, & Epiney, 2011). Mothers in the qualitative studies mentioned that informal mindfulness was more commonly practiced during the postpartum period as it did not require intentional effort to practice it (Fisher et al., 2012; Malis et al., 2017). Most mothers found it challenging to practice formal mindfulness during the postpartum period due to the demands of parenthood (Fisher et al., 2012; Malis et al., 2017). More focus can be placed on teaching informal mindfulness to expectant mothers as the practice of informal mindfulness is less time consuming compared to the practice of formal mindfulness, which will be helpful in the stressful postpartum period.

Currently, MBCE programs such as MBCEP are offered as optional classes to expectant parents if they are interested. These programs can be costly as they are offered outside public hospitals at a price of USD\$350 for six sessions (Baraz, 2019). Healthcare professionals, especially nurses, can look into incorporating MBCE programs as antenatal educational classes to be taught to expectant parents during the antenatal period in public hospitals. In this way, classes can be made affordable for expectant parents in need of financial help. In this review, only two quantitative studies (Byrne et al., 2014; Duncan et al., 2017) were found to have follow-up timepoints during the postpartum period. Future longitudinal studies with follow-up timepoints during the postpartum period should be conducted to ascertain the effectiveness of MBCE programs on maternal outcomes during the postpartum period.

Limitations

This review included studies with methodological flaws. The small sample sizes in the pilot studies and the inclusion of participants with prior yoga, meditation, and major stressful life event experiences prior to receiving the programs may have influenced the effectiveness and accuracy of the programs on maternal outcomes. Additionally, due to the small sample sizes of the studies, the receptivity of the programs among pregnant women could not be accurately assessed. The reviewed studies were of varied methodologies and examined varied maternal outcomes with varied instruments and at different timepoints. A meta-analysis was not carried out as the review's aim was not on examining the effectiveness of current MBCE programs. The broad review aims of consolidating current evidence on MBCE programs on maternal outcomes and of providing recommendations to improve future MBCE programs led to the need to conduct a narrative synthesis. This rendered the pooling of results using a qualitative synthesis to be less accurate. This review only included peer-reviewed studies published in English and such constraints may have excluded relevant studies published in other languages.

Recommendations for Future Research and Practice

Future mixed-method studies can examine the effectiveness of MBCE programs and perspectives of such programs. Future longitudinal studies with longer follow-up timepoints should be conducted to examine the effectiveness of the programs on maternal outcomes during the postpartum period. Additionally, future studies should evaluate the efficacy of the programs using an ideal sample size and exclude participants with prior yoga or meditation experiences. Future MBCE programs can focus on the practice of informal mindfulness as it was deemed to be more feasible and were better preferred by the participants compared to the practice of formal mindfulness during the postpartum period. The cost effectiveness and receptivity of MBCE programs among expectant parents in comparison with traditional antenatal classes can be further explored as MBCE programs have a comparatively longer duration. Healthcare professionals, especially nurses, may consider teaching mindfulness techniques in current antenatal classes to expectant parents as this review found that incorporating mindfulness techniques with childbirth education resulted in improved maternal psychosocial outcomes.

Conclusion

This review examined studies that used the MBCEP and MBCE programs that were specifically designed for pregnancy, childbirth, and parenting. The programs were longer compared to traditional antenatal classes, but attendance rates were high among expectant parents in this review. The programs were found to improve maternal psychosocial outcomes. The benefits and challenges of practicing formal and informal mindfulness during the postpartum period were discussed. This review included studies with small sample sizes and participants with prior yoga and/or meditation experiences, which may hinder an accurate judgement of the efficacy of the programs. However, this review has provided recommendations for future MBCE programs and research. Future MBCE studies should be conducted in their specific cultural contexts and should have longer follow-up timepoints in the postpartum period. Future MBCE programs can focus on teaching informal mindfulness practice, which was found to be beneficial during the postpartum period. Healthcare professionals, especially nurses, can explore teaching mindfulness techniques in current antenatal classes.

Acknowledgments

The authors would like to thank the Publications Support Unit, for assistance in the language editing of this manuscript.

Funding Statement

The work received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:[10.1016/j.outlook.2019.05.004](https://doi.org/10.1016/j.outlook.2019.05.004).

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