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The Role of Exercise for Postpartum Depression and Well-being

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Abstract

Postpartum depression is a prevalent condition (American Psychological Association, 2018). Untreated postpartum depression can have serious consequences for the mother and baby (McCurdy, Boule, Sivak, & Davenport, 2017). Traditional treatment options may not be feasible. Exercise is an effective treatment for adults with depression (McCurdy et al., 2017). Less is known about treating postpartum depression with exercise. This review of the literature sought to understand in postpartum mothers, how a regimen of regular exercise, compared to no regular exercise, impacted the perception of wellbeing and/or postpartum depression scores. The Cumulative Index to Nursing and Allied Health Literature (CINAHL) Plus with Full Text, Cochrane Database of Systematic Reviews, PubMed, and SAGE Journals were searched for relevant research articles using keyword combinations and no parameters on publication dates. Studies included focused on exercise during the postpartum period and studies measuring the subjective and objective impact of exercise. Studies were excluded from the review if the effects of exercise were studied during pregnancy or if the exercise was poorly defined. The design of studies included were four randomized controlled trials (RCTs), one quasi-experimental, one systematic review of RCTs, one retrospective cohort, and one cross-sectional. Results showed that exercise may be a useful treatment for postpartum depression. Other benefits included decreased levels of fatigue, increased physical fitness, and weight loss. One strength of the review is that most studies included well-designed RCTs and all used validated tools to measure postpartum depression scores and fatigue. Limitations included not knowing if participants were concurrently using psychotherapy and antidepressants, gaps in the research, lack of generalizability, and multiple barriers to implementation. In conclusion, exercise can be used as

an adjunct therapy for postpartum depression. Future research should focus on specific types of exercise, frequency, and timing needed to affect postpartum depression.

Keywords: exercise, physical activity, postpartum depression, postnatal depression

The Role of Exercise for Postpartum Depression and Wellbeing

Motherhood is marked by an array of emotions. Some emotions experienced by mothers include excitement, joy, fear, and anxiety (Mayo Clinic, 2015). Although these emotions of fear and anxiety are common, they can also be a warning sign that the mother may be experiencing postpartum depression (Mayo Clinic, 2015). This condition is prevalent and affects as many in one in seven mothers (APA, 2018). If postpartum depression goes untreated, there can be severe consequences for the mother and baby (McCurdy et al., 2017). Family nurse practitioners (FNPs) must be knowledgeable about diagnosing and treating postpartum depression in primary care. This is prudent because standard obstetrical care ceases at six weeks postpartum and postpartum depression can develop up to one year after giving birth (The American College of Obstetricians and Gynecologists [ACOG], 2013).

Background

During the first few weeks after childbirth, mothers may experience what is known as the baby blues (Mayo Clinic, 2015). Symptoms of this include mood lability, anxiety, sadness, irritability, feeling overwhelmed, crying, poor concentration, change in appetite, and insomnia (Mayo Clinic, 2015). Baby blues typically resolves in two weeks; if the symptoms persist longer than this time period, the mother may be experiencing postpartum depression (Mayo Clinic, 2015).

Symptoms of postpartum depression include depression, severe mood swings, excessive crying, troubles bonding with baby, withdrawing from family and friends, change in appetite, overwhelming fatigue, loss of energy, intense irritability, anger, fear, poor concentration, severe anxiety, panic attacks, thoughts of harming self or baby, and thoughts of death or suicide (Mayo Clinic, 2015). Postpartum depression commonly develops the first few weeks after having the

baby; however, it can develop up to six months to one year after giving birth (ACOG, 2013; Mayo Clinic, 2015). The cause of postpartum depression is unknown, but it is thought to be related to fluctuating hormones (estrogen and progesterone) as a result of childbirth and other factors, such as the mother's emotional wellness and lifestyle factors (ACOG, 2013; Mayo Clinic, 2015).

Clinicians diagnose postpartum depression using depression screening questionnaires and/or the Diagnostic and Statistical Manual of Mental Disorders, published by the American Psychiatric Association (Mayo Clinic, 2015). Traditional treatment includes psychotherapy and/or the use of antidepressant medications (Mayo Clinic, 2015). Untreated postpartum depression can compromise the mother's ability to care for her baby, disrupt bonding, and delay the infant's cognitive, social, and emotional development (McCurdy et al., 2017). It can also lead to maternal suicide (McCurdy et al., 2017).

Psychotherapy can be expensive and difficult for a mother to attend when she is caring for an infant (McCurdy et al., 2017). Some mothers are also hesitant to use medications because they worry about the effects on the baby, especially if they are breastfeeding (ACOG, 2013). Because some mothers may not have the resources or access to psychotherapy, or be hesitant to take medications, it is important to explore additional evidence-based treatment modalities for postpartum depression.

Many studies have been published that identify exercise as an effective treatment for adults with depression (McCurdy et al., 2017). Less is known about how exercise affects postpartum depression. This paper will seek to understand in postpartum mothers, how does a regimen of regular exercise, compared to no regular exercise, impact the perception of wellbeing and/or postpartum depression scores?

Methods

CINAHL Plus with Full Text, Cochrane Database of Systematic Reviews, PubMed, and SAGE Journals were searched for relevant research articles. Restrictions added to search included English language, full text, peer reviewed, and research article (see Table A1 for the general subjects covered and search restrictions added for each database). No parameters were set on the publication dates. Keywords searched were a combination of exercise, physical activity, postpartum depression, and postnatal depression. The search produced 361 hits. The title, abstract, conclusion, and bibliography of 11 articles were reviewed for relevancy to the clinical question. Table A2 identifies the keyword combinations, number of hits per database, and the articles fully reviewed for a match with the inclusion criteria. The seven studies included in the systematic review focused on exercise during the postpartum period and measuring the subjective and objective impact of exercise (see Table A3 for studies included and excluded along with the corresponding rationale). All types of exercise were included. Articles were excluded from the systematic review if the effects of exercise were studied during pregnancy or if the exercise was poorly defined. One study in particular was excluded because the authors did not define what constituted as exercise. According to the Hierarchy of Evidence, the types of studies included in the systematic review were one systematic review of RCTs (level I), four randomized controlled trials (RCTs) (level II), one quasi-experimental (level III), one retrospective cohort (level IV), and one cross-sectional (level IV) (see Table A4 for each study's purpose, sample population, setting, design, level of evidence, variables, instruments, interventions, findings, and implications) (Melnyk & Fineout-Overhold, 2015).

Summary of the Literature

Prominent themes emerged from the review of the literature pertaining to the impact of exercise on postpartum depression and wellbeing. The effects of exercise on postpartum depression include a reduction in depressive symptoms, along with increased sense of wellbeing. The evidence pertaining to each theme is discussed below.

Postpartum Depression

Several studies found that exercise may be useful as a treatment for postpartum depression (Daley, Psychol, MacArthur, & Winter, 2007; Forsyth, Boath, Henshaw, & Brown, 2017; Hen, Huang, Ho, Fu, & Wang, 2008; Ko, Yang, Fang, Lee, & Lin, 2012; McCurdy, Boule, Sivak, & Davenport, 2017; Szalewska & Skrzypkowska, 2016; Vo, Hoa, & Hoang, 2017). In one study the intervention group, or mothers with postpartum depression, walked with their prams two to three times per week while the control group maintained their usual exercise regimen and social activities (Daley et al., 2007). The intervention groups had lower depression scores than the control groups (Daley et al., 2007).

In another study, mothers participated in a 60-minute motivational consultation to encourage them to engage in moderate intensity exercise 150 minutes per week for 12 weeks (Forsyth et al., 2017). They could choose between structured or self-initiated exercise (Forsyth et al., 2017). The control group continued their usual health care program (Forsyth et al., 2017). Exercise had no significant effect on depression scores, however mothers reported that structured and self-initiated exercise reduced their postpartum depression (Forsyth et al., 2017).

Heh and colleagues (2008) included an exercise support guide that was recorded onto a compact disc (CD) along with an hour per week of group exercise. Mothers in the intervention group repeated the exercise routine record onto the CD at home twice weekly for six weeks while the control group received standard care (Heh et al., 2008). Both groups had a significant

reduction in their depression scores at five months postpartum; however, the intervention group had a more effective decrease in their scores than the control group (Heh et al., 2008).

A quasi-experimental study was designed to examine how exercise effects postpartum depression, fatigue, and body composition of mothers (Ko et al., 2012). Mothers participated in an exercise program once a week for an hour for 12 weeks (Ko et al., 2012). There was no control group (Ko et al., 2012). Mothers who completed the 12 sessions of exercise had a significant decrease in their depression scores (Ko et al., 2012).

Among the articles selected for inclusion was a systematic review of RCTs. The interventions included combined aerobic and resistance training, yoga, whole-body gentle stretching, or a co-intervention of social support, dietary program, and education (McCurdy et al., 2017). Interventions ranged from 1 to 5 times per week for 30 to 60 minutes per session and for 6 weeks to 12 months duration (McCurdy et al., 2017). The control groups received standard care, wait list controls, attentional controls, or education (McCurdy et al., 2017). Researchers found that mild-to-moderate postpartum depression improved with light-to-moderate intensity aerobic exercise and was more likely to resolve by 54% (McCurdy et al., 2017).

A retrospective cohort study examined physical activity patterns and their link to postpartum depression (Szalewska & Skrzypkowska, 2016). Participants filled out self-reported questionnaires (Szalewska & Skrzypkowska, 2016). Researchers found that exercise may reduce the symptoms of postpartum depression (Szalewska & Skrzypkowska, 2016).

Another study sought to ascertain the prevalence of postpartum depression, along with identifying social and personal factors associated with postpartum depression (Vo et al., 2017). This cross-sectional study did not have an intervention; participants filled out structured

questionnaires (Vo et al., 2017). They found mothers that exercised after birth were less likely to have postpartum depression than those who did not (Vo et al., 2017).

Two studies found that depression scores were not reduced significantly in mothers who were exercising after giving birth (Forsyth et al., 2017; Ko, Yang, & Chiang, 2008). The first study mothers participated in a 60-minute motivational consultation to encourage them to engage in moderate intensity exercise 150 minutes per week for 12 weeks (Forsyth et al., 2017). They could choose between structured or self-initiated exercise (Forsyth et al., 2017). The control group continued their usual health care program (Forsyth et al., 2017). Results showed that exercise had no significant effect on depression scores, however mothers reported that structured and self-initiated exercise reduced their postpartum depression (Forsyth et al., 2017). The second study was at a Taiwanese maternity center (Ko et al., 2008). The intervention group participated in 6 exercise session programs, while the control group followed usual care (Ko et al., 2008). Depression scores were not reduced significantly in either group (Ko et al., 2008).

Wellbeing

The review of the literature revealed additional benefits to mothers who exercised during the postpartum period. Women who exercised during the postpartum period experienced an increased sense of wellbeing. The evidence pertaining to each theme is discussed below.

Fatigue. The review of the literature revealed additional benefits to mothers who exercised after giving birth. The study conducted by Ko et al. (2008) at a Taiwanese maternity center found that the mothers in the intervention group had a statistically significant reduction in their physical fatigue, psychological fatigue, and fatigue symptoms. The control group followed usual care and they only had a significant reduction in their physical fatigue (Ko et al., 2008).

However, one study found that there was no significant difference in fatigue after mothers participated in an exercise program once a week for an hour for 12 weeks (Ko et al., 2012).

Physical Fitness. Improved physical fitness is another benefit mothers gained with exercise (Daley et al., 2007; Vo et al., 2017). The study by Daley et al. (2007) included mothers walking with their prams 2 or 3 times a week. The control group maintained their usual exercise (Daley et al., 2007). This study found that the intervention group had significantly improved aerobic fitness, as compared to the control group (Daley et al., 2007). Another study showed that exercise may help mothers recover postpartum and regain strength (Vo et al., 2017).

Weight Loss. Another result of exercise was mothers losing weight (Ko et al., 2012; Szalewska & Skrzypkowska, 2016). One study showed that after participating in an exercise program, mothers had significant reductions in body weight, body fat percentage, fat mass, and basal metabolic rate (Ko et al., 2012). A second study showed that mothers in the active group returned to their pre-pregnancy weight with greater ease than the mothers who were not physically active (Szalewska & Skrzypkowska, 2016).

Discussion

The summary of the literature supports that regular exercise can positively postpartum depression scores in mothers and increase their sense of wellbeing. There are notable strengths in this body of evidence. The studies included in the systematic review were mostly high levels of evidence with well-designed RCTs. Furthermore, each study used validated tools to measure postpartum depression scores and fatigue. These well-designed studies and validated tools make the results of the studies more reliable.

Although there are strengths in the literature, there are also limitations. Some of the studies were lower levels of evidence and did not have well-designed interventions. They used

questionnaires to ask mothers about exercising after giving birth. This is a limitation because mothers may not clearly recall their exercise regimen and postpartum depression symptoms weeks to months after the fact.

Using psychotherapy and antidepressants to treat postpartum depression was another limitation. In some of the studies, it was unknown whether a mother was using these modalities. In other studies, it was known that a mother was undergoing psychotherapy and/or taking an antidepressant. This is a limitation because it may have skewed the results of the research.

Another limitation is the generalizability of the research. None of the studies included in the systematic review were conducted in the United States. Because of cultural differences, the results may not be applicable to mothers living in other countries.

A gap in the literature also exists. The studies included in the systematic review included all forms of exercise. It also included varying times and frequency of exercise. Because of this, it is unknown what type of exercise and dose (frequency, duration, and intensity) is needed to affect postpartum depression.

Barriers to implementing exercise as a treatment for postpartum depression also exist. One barrier is that it may be difficult to motivate a depressed mother to exercise (Daley et al., 2007; Forsyth et al., 2017). Also, the postpartum period is busy and the mother may have difficulty finding the time to exercise (Daley et al., 2007). The additional expense of exercise may also be a barrier for some (Daley et al., 2007; Forsyth et al., 2017). Other things, such as breastfeeding and physically recovering from birth, may not make exercising feasible (Daley et al., 2007). Lack of social support or relationship demands, may pose additional barriers making exercising difficult (Forsyth et al., 2017).

Although there are limitations to the research, the findings of the systematic review did support that exercise may be a useful treatment for postpartum depression. Along with decreasing the symptoms of postpartum depression, there are other benefits gained with exercising after giving birth. These include decreased levels of fatigue, increased physical fitness, and weight loss (Daley et al., 2007; Ko et al., 2008; Ko et al., 2012; Szalewska & Skrzypkowska, 2016; Vo et al., 2017). These findings may improve the wellbeing of mothers in the short-term, as well as the long-term.

Implications

Evidence suggests that exercise may be a useful treatment for postpartum depression. It is important to note that there were no adverse side effects of exercise identified in the literature. Because of this, it would be reasonable to suggest exercise to mothers as an adjunct therapy for postpartum depression. Exercise could also be suggested for mothers who are struggling with fatigue, low-levels of fitness, and difficulty with weight loss. Because there are no standard recommendations for exercise to decrease postpartum depression symptoms, the FNP and patient must devise an exercise regimen unique to the patient and their situation.

Although the results of exercise as a treatment for postpartum depression is promising, more research is needed. Future research should focus on whether specific types of exercise are more beneficial than others. Research should also investigate the frequency, duration, and intensity needed to affect postpartum depression. Finally, no study looked at the timing of the exercise in the postpartum period. Future research should also focus on the optimal timing for initiating a postpartum exercise program to positively affect postpartum depression.

Conclusion

Postpartum depression is a prevalent condition experienced by mothers (APA, 2018). Traditional treatment includes psychotherapy and/or the use of antidepressant medications (Mayo Clinic, 2015). Psychotherapy may not be feasible for some mothers because of the cost and/or logistics with an infant (McCurdy et al., 2017). Medications may not also be ideal for the breastfeeding mother (ACOG, 2013). Mounting evidence suggests that exercise may be useful as a treatment for postpartum depression. Although there are limitations to the current evidence, there is no evidence to suggest this is harmful to mothers. What has been shown is that mothers who exercise after giving birth may actually experience a greater wellbeing. Because of this, FNPs may suggest exercise as an adjunct therapy for postpartum depression.

References

American Psychological Association. (2018). Postpartum depression. Retrieved from http://www.apa.org/pi/women/resources/reports/postpartum-depression.aspx

Daley, A. J., Psychol, C., MacArthur, C., & Winter, H. (2007). The role of exercise in treating postpartum depression: A review of the literature. *American College of Nurse Midwives, 52*(1), 56-62. http://dx.doi.org/10.1016/j.jmwh.2006.08.017

Forsyth, J., Boath, E., Henshaw, C., & Brown, H. (2017). Exercise as an adjunct treatment for postpartum depression for women living in an inner city: A pilot study. *Health Care for Women International, 38*(6), 635-639. http://dx.doi.org/10.1080/07399332.2017.1295049

Heh, S. S., Huang, L. H., Ho, S. M., Fu, Y. Y., & Wang, L. L. (2008). Effectiveness of an exercise support program in reducing the severity of postnatal depression in Taiwanese women. *Birth, 35*(1), 60-65. http://dx.doi.org/10.1111/j.1523-536X.2007.00192.x

Ko, Y. L., Yang, C. L., & Chiang, L. C. (2008). Effects of postpartum exercise program on fatigue and depression during "doing-the-month" period. *Journal of Nursing Research, 16*(3), 177-186. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/18792887

Ko, Y. L., Yang, C. L., Fang, C. L., Lee, M. Y., & Lin, P. C. (2012). Community-based postpartum exercise program. *Journal of Clinical Nursing, 22*(15-16), 2122-2131. http://dx.doi.org/10.1111/jocn.12117

Mayo Clinic. (2015). Postpartum depression. Retrieved from https://www.mayoclinic.org/diseases-conditions/postpartum-depression/symptoms-causes/syc-20376617

McCurdy, A. P., Boule, N. G., Sivak, A., & Davenport, M. H. (2017). Effects of exercise on mild-to-moderate depressive symptoms in the postpartum period. *The American College*

of Obstetricians and Gynecologists, *129*(6), 1087-1097. http://dx.doi.org/10.1097/AOG.000000000000205

Melnyk, B. M., & Fineout-Overholt, E. (2015). *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice* (3rd ed.). Philadelphia, PA: Wolters Kluwer.

Szalewska, D., & Skrzypkowska, M. (2016). Physical activity patterns, depressive symptoms and awareness of cardiovascular risk factors in postpartum women. *Annals of Agricultural and Environmental Medicine*, *23*(3), 502-505. http://dx.doi.org/10.5604/12321966.1219195

The American College of Obstetricians and Gynecologists. (2013). Postpartum depression. Retrieved from https://www.acog.org/Patients/FAQs/Postpartum-Depression

Vo, T. V., Hoa, T. H., & Hoang, T. D. (2017). Postpartum depressive symptoms and associated factors in married women: A cross-sectional study in Danang City, Vietnam. *Frontiers in Public Health*, *5*(93). http://dx.doi.org/10.3389/fpubh.2017.00093

Appendix

Table 1

Database Search Description

Database (or Search Engine)	Restrictions Added to Search	Dates Included in Database	General Subjects Covered by Database
1. CINAHL Plus with Full Text	Full text, English language, research article, peer reviewed	All	Nursing and allied health
2. Cochrane Database of Systematic Reviews	Full text	All	Human health care and health policy
3. PubMed	Free full text	All	Biomedical literature
4. SAGE Journals	Full access only	All	Health sciences, material sciences, engineering, social sciences, humanities, and life and biomedical sciences

Table 2

Data Abstraction Process

Date of Search	**Key Words**	**Hits in PubMed**	**Hits in CINAHL Plus with Full Text**	**Hits in Cochrane Database of Systematic Reviews**	**Hits in SAGE Journals**
10/23/17	"Exercise" AND "Postpartum depression"	45; ***5**	27; ***5**	1	5; ***1**
10/23/17	"Exercise" AND "Postnatal depression"	70	24	3	0
10/23/17	"Physical activity" AND "Postpartum depression"	56	18	1	3
10/23/17	"Physical activity" AND "Postnatal depression"	87	20	1	0

***BOLD** = articles reviewed for match with systematic review inclusion criteria

Table 3

Characteristics of Literature Included and Excluded

Reference	**Included or Excluded and Document**	**Rationale**
Daley, A. J., Psychol, C., MacArthur, C., & Winter, H. (2007). The role of exercise in treating postpartum depression: A review of the literature. *American College of Nurse Midwives*, *52*(1), 56-62. http://dx.doi.org/10.1016/j.jmwh.2006.08.017	Included	Discussed 2RCTs that showed promising results for postpartum women.
Demissie, Z., Siega-Riz, A. M., Evenson, K. R., Herring, A. H., Dole, N., & Gaynes, B. N. (2011). Associations between physical activity and postpartum depressive symptoms. *Journal of Women's Health*, *20*(7), 1025-1034. http://dx.doi.org/10.1089/jwh.2010.2091	Excluded	Moderate to vigorous physical activity (MVPA) was separated into recreational and non-recreational categories. Researchers did not define what constituted as recreational MVPA. Unsure if exercise would be defined at recreational MVPA in the study.
Forsyth, J., Boath, E., Henshaw, C., & Brown, H. (2017). Exercise as an adjunct treatment for postpartum depression for women living in an inner city: A pilot study. *Health Care for Women International*, *38*(6), 635-639. http://dx.doi.org/10.1080/07399332.2017.1295049	Included	Intervention showed promising results for postpartum women. Study included qualitative and quantitative data. Participants lived in an inner-city. These are women likely to present to primary care and may not be able to afford pharmacotherapy or psychotherapy for the treatment of postpartum depression (PPD).
Heh, S. S., Huang, L. H., Ho, S. M., Fu, Y. Y., & Wang, L. L. (2008). Effectiveness of an exercise support program in reducing the severity of postnatal depression in Taiwanese women. *Birth*, *35*(1), 60-65. http://dx.doi.org/10.1111/j.1523-536X.2007.00192.x	Included	Intervention showed promising results for postpartum women.
Ko, Y. L., Yang, C. L., & Chiang, L. C. (2008). Effects of postpartum exercise program on fatigue and depression during "doing-the-month" period. *Journal of Nursing Research*, *16*(3), 177-186. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/18792887	Included	Intervention showed decreased fatigue in postpartum women, which research has shown to decrease PPD.
Ko, Y. L., Yang, C. L., Fang, C. L., Lee, M. Y., & Lin, P. C. (2012). Community-based postpartum exercise program. *Journal of Clinical Nursing*, *22*(15-16), 2122-2131. http://dx.doi.org/10.1111/jocn.12117	Included	Intervention showed promising results for postpartum women.
Lewis, B. A., & Kennedy, B. F. (2011). Effects of exercise on depression during pregnancy and postpartum: A review. *American Journal of Lifestyle Medicine*, *5*(4), 370-378. http://dx.doi.org/10.1177/1559827610392891	Excluded	Many of the studies reviewed in are included in this paper as the original research. Also, some of the studies review did not apply because it focused on exercise during pregnancy, rather than the postpartum period.
McCurdy, A. P., Boule, N. G., Sivak, A., & Davenport, M. H. (2017). Effects of exercise on mild-to-moderate depressive symptoms in the postpartum period. *The American College of Obstetricians and*	Included	Highest level of evidence. Showed promising results for postpartum women.

Reference	Included or Excluded and Document	Rationale
Gynecologists, *129*(6), 1087-1097. http://dx.doi.org/10.1097/AOG.0000000000000205		
Pritchett, R., Jolly, K., Daley, A. J., Turner, K., & Bradbury-Jones, C. (2017). Women's experiences of exercise as a treatment for their postnatal depression: A nested qualitative study. *Journal of Health Psychology*, 1-8. http://dx.doi.org/10.1177/1359105317726590	Excluded	This was a qualitative study nested with a RCT. Researchers did not discuss in-depth the implications that exercise had on PPD. They mentioned the use of a PPD screening tool, but did not provide the score pre- or post-intervention.
Szalewska, D., & Skrzypkowska, M. (2016). Physical activity patterns, depressive symptoms and awareness of cardiovascular risk factors in postpartum women. *Annals of Agricultural and Environmental Medicine*, *23*(3), 502-505. http://dx.doi.org/10.5604/12321966.1219195	Included	Exercise showed promising results for postpartum women.
Vo, T. V., Hoa, T. H., & Hoang, T. D. (2017). Postpartum depressive symptoms and associated factors in married women: A cross-sectional study in Danang City, Vietnam. *Frontiers in Public Health*, *5*(93). http://dx.doi.org/10.3389/fpubh.2017.00093	Included	Exercise showed promising results for postpartum women.

Table 4

Literature Review Table of All Studies Included

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
Daley, Psychol, MacArthur, and Winter (2007)	Examine the potential role of exercise as a treatment for postpartum depression. (PPD).	1. n = 20; Australia 2. n = 24; Australia	RCTs Level II	1. Edinburgh Postnatal Depression Scale (EPDS) 2. EPDS	1. Pram walking 3 times a week plus social support once a week. Control group maintained their usual exercise regimen and social activities. 2. Twice-weekly pram walking was compared to a group receiving social support intervention.	1. Intervention group had significantly lower EPDS scores than control group at 6-weeks and 12-weeks (end of the intervention) ($p < 0.01$). Intervention group also had significantly improved aerobic fitness post-intervention compared to the control group ($p < 0.01$). 2. Intervention group had significantly lower EPDS scores than the control group at 12-weeks (end of intervention) ($p <0.05$). Intervention group also had significantly improved aerobic fitness post-intervention compared to the control group ($p < 0.01$). No significant change in social support for either group.	1. Exercise may be useful as a treatment for PPD. 2. Exercise may be useful as a treatment for PPD.

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
Forsyth, Boath, Henshaw, and Brown (2017)	Examine the potential role of exercise as a treatment for PPD for women living in an inner-city.	n = 22; Stroke-on-Trent, United Kingdom	RCT Level II	Structured Clinical Interview for DSM-IV (Perinatal Version) (SCID-PN) EPDS Thematic framework analysis	Sixty-minute motivation consultation to encourage participants to exercise 150 minutes per week of moderate intensity exercise for 12 weeks. Participants could choose structured or self-initiated exercise. Control group continued their usual health care program.	Exercise had no significant effect on SCID-PN diagnosis after 3 months ($p = 0.37$) and 6 months ($p = 0.66$). There was also no significant effect on EPDS scores after 3 months ($p = 0.59$) and 6 months ($p = 0.173$). Mothers viewed structured and self-initiated exercise as favorable for their PPD.	There was a low adherence rate to exercise. This could be the reason why mothers viewed exercise as favorable, but there was not a significant effect on SCID-PN diagnosis or EPDS scores. Future research should encourage exercise adherence.

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
Heh, Huang, Ho, Fu, and Wang (2008)	Examine the potential role of exercise as a treatment for PPD for Taiwanese women.	n = 63; Taiwan	RCT Level II	EPDS	An exercise support guide recorded on a CD, along with an hour per week of group exercise. These sessions were recorded on the CD and participants repeated them twice weekly at home for 6 weeks. Control group received standard care.	Both groups had a significant reduction in EPDS scores 5 month postpartum ($p = 0.00$). However, the intervention group had a more effective decrease in EPDS scores than the control group ($p = 0.01$).	An exercise support program may enhance a postpartum woman's psychological well-being.

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
Ko, Yang, and Chiang (2008)	Examine the potential role of exercise as a treatment for fatigue and PPD.	n = 61; Taiwan	RCT Level II	Fatigue Symptoms Checklist (FSC) Center for Epidemiologic Studies Depression Scale (CES-D)	All mothers were staying at a Taiwanese maternity center. Intervention group participated in 6 exercise session programs. Control group followed usual care.	Intervention group had a significant change in their physical fatigue, psychological fatigue, and fatigue symptoms ($p < 0.05$). Control group only had a significant change in physical fatigue ($p < 0.05$). Depression scores were not reduced significantly in either group.	Low-intensity exercise may be helpful in reducing fatigue in postpartum mothers. Research shows some mothers report “fatigue” rather than depression. This exercise may also be helpful for PPD.

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
Ko, Yang, Fang, Lee, and Lin (2012)	Examine a postpartum exercise program. Study also examined differences in body composition, fatigue, and depression of participants before and after the exercise program.	n = 23; Taipei	Quasi-experimental Level III	Self-designed structured questionnaire Body composition analyzer FSC CES-D	Mothers participated in an exercise program once weekly for an hour for 12 weeks; a total of 12 sessions. No control group.	After participating in the exercise program, mothers had a significant decrease in the depression score ($p = 0.021$). No significant difference in fatigue after participating in the exercise program ($p > 0.05$). After the exercise program, mothers had significant reductions in body weight, body fat percentage, fat mass, and basic metabolic rate ($p < 0.001$).	Exercise may be useful as a treatment of PPD. Participating in regular exercise can help mothers regain their previous figure.

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
McCurdy, Boule, Sivak, and Davenport (2017)	Examine the influence of exercise on symptoms of depression and the prevalence of postpartum depression.	n = 1,327; worldwide	Systematic review of RCTs Level I	EPDS Hamilton Depression Rating Scale SCID-PN International Statistical Classification of Diseases and Related Health Problems	Combined aerobic and resistance training Yoga Whole-body gentle stretching program Co-interventions of social support, dietary program, education Interventions ranged from 1 to 5 times per week for 30 to 60 minutes per session. Interventions last from 6 weeks to 12 months. Control groups received standard care, wait list controls, attentional controls, or education.	Mild-to-moderate PPD is improved with light-to-moderate intensity aerobic exercise (95% confidence interval). Also, this type of exercise increases the likelihood that mild-to-moderate PPD will resolve (54% odds ratio).	Exercise may be useful as a treatment of PPD.

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
Szalewska and Skrzypkowska (2016)	Examine physical activity patterns and their link to PPD.	n = 80; setting not specified	Retro-spective cohort study Level IV	Physical activity and health awareness were measured by a self-report questionnaire EPDS	No intervention	Exercise may reduce symptoms of PPD ($p = 0.034$). Health awareness was better in the mothers who were physically active in the 6-month period postpartum than those who were not ($p = 0.001$). Mothers in the active group returned to their pre-pregnancy weight with greater ease than the mothers who were not physically active.	Being physically active in the 6-month period postpartum can increase health awareness, increase weight loss, and may reduce the risk of PPD.

Citation	**Study Purpose**	**Pop (N)/ Sample Size (n) /Setting(s)**	**Design/ Level of Evidence** (Melnyk & Fineout-Overholt, 2015)	**Variables/ Instruments**	**Intervention**	**Findings**	**Implications**
Vo, Hoa, and Hoang (2017)	Estimate the prevalence of PPD in married women living in Danang, Vietnam and to identify social and personal factors associated with PPD.	n = 600; Danang, Vietnam	Cross-sectional Level IV	Structured questionnaires EPDS	No intervention	Prevalence of PPD was 19.3%. Mothers that exercised after birth were less likely to have PPD than those who did not. Exercise may help mothers recover postpartum, regain strength, and reduce stress.	Exercise may be useful to decreased symptoms of PPD.

Melnyk, B. M., & Fineout-Overholt, E. (2015). *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice* (3rd ed.). Philadelphia, PA: Wolters Kluwer.