Abstract of thesis entitled

The Effectiveness of Physical Activities in Reducing Depressive Symptoms of Postnatal Depressed Women

Submitted by

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for the degree of Master of Nursing
at The University of Hong Kong
in July 2014

Depression affects more than 340 million people over the world. It serves as a leading cause of disability and is a serious problem across culture. The current practice in Hong Kong relies heavily on pharmacological therapy and psychological therapy. The effectiveness of these two types of therapy is limited by the side-effects of the medications and the accessibility to medical facilities for psychological therapy.

Physical activity is suggested by many studies to be effective in managing depressive symptoms. Physical exercise is a relatively economic and convenient activity that can be self-administered for health. Some studies have suggested that physical activity is effective for managing depression, yet the number of theses on this topic for the treating postnatal depression is limited.

In this thesis, studies related to the effectiveness of physical activity on depressive symptoms alleviation among postpartum women were reviewed and critically appraised. Studies were searched using the databases Pubmed, CINAHL Plus and PsycINFO, and a
total of 7 relevant studies were found.

The 7 studies were analyzed and listed as tables of evidence and appraised with the SIGN checklist for their quality. The results of these studies and the quality of the papers were summarized.

Regarding the physical activity types examined in these studies, moderate intensity exercise such as pram-walking exercise was found to be effective for alleviating depressive symptoms among the postnatal depressed women.

The feasibility and transferability of the desired intervention to the target population and setting were discussed. An evidence-based guideline with recommendations was also developed.

Finally, plans for communication with stakeholders and end-users, overcoming resistance from providers, step-by-step implementation for the intervention, evaluation are all to be developed in this project.
Declaration

I declare that this thesis represents my own work, except where due acknowledgment is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualifications.

Signed ………………………………………………………………………………………………………

Chan Wing Man Vivian
Acknowledgements

I would like to express my deepest gratitude to my supervisor, Dr Vivian Ngai, for her expert advice and guidance. Dr Vivian Ngai has guided me through the completion of the paper. This dissertation would not have been completed without her invaluable advice.

My thanks must also go to my family, who has provided me with ongoing support and encouragement. They helped to make this dissertation a success.
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CHAPTER 1: INTRODUCTION

Depression affects more than 340 million people over the world (Greden, 2001). It serves as a leading cause of disability and is a serious problem across culture (Greden, 2001). According to Palmer (2005), depression is a serious illness which affects every domain of a person’s life. One in eight people will suffer from depression in their lives with the lifetime risk for depression in women is 20-30%, while 7-12% in men (Stuart & Laraia, 2009). Evidence shows that, women during the childbearing period are at increasing risk of developing depression (Vesga et al., 2008; Cheng, Walker, & Chu, 2013). Postnatal Depression (PND) is a common form of maternal mood disorder after childbirth. It is also a major mental health issue in women, it affects 13% of all new mothers worldwide (Mousavi, 2007).

In the past, it was generally believed that postnatal depression was less likely happened in the Chinese populations. However, in the recent reports and medical review suggested an opposite result (Ho & Tao, 2000). By using the Edinburgh Postnatal Depression Scale (EPDS) as the instrument to assess postnatal mood changes, 10% to 15% postnatal women was found to have significant depression symptoms in the studies conducted both in China and Hong Kong (Ho & Tao, 2000).
Postnatal Depression is classified to be a major public health problem by National Health and Medical Research Council in 2000. It is a common form of maternal mood disorder after childbirth. As it is widely recognized that the early years of childhood is of great importance to human development (Shonkoff & Philips, 2000), mothers suffered from postnatal depression would greatly affect the ability of child care. In consequence, PND would associate with significant maternal and infant morbidity and mortality (Vesga et al., 2008). With its significant impact on women, children and their family, it is worth in developing an intervention to reduce its psychological morbidity.

1.1 Background

Types of Postnatal Mood Disorders

It is important to define the different types of postnatal mood disorders, in order to provide appropriate treatment and support. They can be mainly classified into three categories: 1) baby blues; 2) postnatal depression; and 3) postnatal psychosis, according to their nature, time of onset, duration, and severity of the symptoms (Epperson & Ballew, 2006). Baby blues is experienced by around 85% of women three or four days after delivery, and it defined as transient and relatively mild mood disorders (Hatloy, 2013). Postnatal psychosis is a very serious mental illness, disorientation and hallucination usually occurred. It can happen quickly,
often within the first three months after childbirth. It affects 0.2% of postpartum women (Hatloy, 2013).

PND is a common form of maternal mood disorder after childbirth. It affects 13% of all new mothers worldwide (Mousavi, 2007). It is a non-psychotic depressive episode and it usually occurs 4 weeks to 1 year postpartum. Symptoms of PND may include a reduced quality of life, sense of insecurity, fatigue, anxious, loss of interest in daily life, feelings of worthlessness and thoughts of suicide (Craig & Howard, 2009). EPDS is used as the instrument to assess postnatal mood changes and the Diagnostic and Statistical Manual of Mental Disorder (DSM-IV), that published by American Psychiatric Association, is used to diagnose PND (Collingwood, 2010). EPDS is a 10-questioned screening tool reflected the emotion of postpartum women at 6-12 weeks after delivery. The American Academy of Pediatrics (2010) recommends using a score of ≥ 10 to initiate a referral. Mothers who score above 13 are likely to be suffering from a depressive illness of varying severity.

Prevalence of Postnatal Depression

According to National Health and Medical Research Council (2000), the estimated average prevalence of postnatal depression is around 13-15% in Australia. For Western population, the averages rate of postnatal depression is 10-15%
More than 50% of postnatal women reported elevated depressive symptoms at some point in the first month after delivery, and 6.5% of women are depressed at 12 months postpartum (Demissie et al., 2011). There were only a few studies reviewed the psychiatric morbidity in Chinese population. The prevalence rates of postnatal depression among Chinese women in Hong Kong and Taiwan is 0.9-2.4% in the past (Chen et al., 1993; Hwu, Yeh, & Chang, 1989). However, the recent epidemiological studies reported that 10-20% of Chinese women are affected by postnatal depression (Chan & Levy, 2004; Gao, Chan, Li, Chan, & Hao, 2010). These reflected that there is a rising trend of women suffering from postnatal depression among Chinese population.

1.2 Affirming Needs

Treatment of Postnatal Depression

The treatments offered currently in Hong Kong include pharmacological therapy and psychological therapy. For the pharmacological therapy, the selective serotonin reuptake inhibitors (SSRI) types of antidepressants are usually recommended. Although, studies have proven that only small amount of these types of antidepressants was found in breast milk and it is unlikely to be harmful (Cooper, Murray, Wilson, & Romaniuk, 2003). Only 19% of women would consider pharmacotherapy (Cooper et al., 2003).
Cognitive behavioral therapy (CBT) and interpersonal therapy (IPT) are two most common forms of psychological therapy that addressed dysfunctional emotions (Schacter, 2010) and often used in women with mild to moderate PND (Craig & Howard, 2009). CBT focuses on changing emotional distress and mental disorder by helping the individual to modify cognitive distortions to directly alter behavior through the use of reinforcement and exposure (Otto, 2005). IPT focuses on modifying interpersonal relationships and communication skills (Bennett, Einarson, Taddio, Koren, & Einarson, 2004). Study shows that 95% of women would prefer psychotherapy and generally had a negative attitude toward pharmacotherapy (Chabrol, Teissedre, Armitage, Danel, & Walburg, 2004).

Psychological therapies work best with voluntary, motivated clients (Roes, 2011). They have consistently shown these to be effective treatments for postpartum depression, but their availability is often limited (Leung, Leung, Chan, Lee, & Ip, 2007). However, among Chinese people, the cultural factor might influence the mother suffer from PND reluctant to disclose their mental health problems or family problems to outsiders (Huang, Wong, Ronzio, & Yu, 2007). In contrast, engaging in exercise does not carry a stigma and can be done outside the standard medical setting. The costs associated with exercise are usually low. Also with increasing burden on medical cost and limited resources, it is worthwhile to
consider an alternative intervention for the treatment of postnatal depression. An alternative method rather than pharmacotherapy and psychotherapy in treating PND would be more convincing.

Effectiveness of Physical Exercise

According to American College of Sports Medicine (2006), exercise is defined as the "planned, structured and repetitive bodily movement done to improve or maintain one or more components of physical fitness". Generally physical activities would define in three levels of intensities that measured by percentage of maximum heart rate (MHR): low (35-54% MHR), moderate (55-69% MHR) and vigorous (70 or above MHR). It mainly falls into four basic categories: endurance, strength, balance, and flexibility.

1) Endurance exercises include aerobic or activities that increase breathing and heart rate. Such as jogging, dancing and swimming.

2) Strength exercise could also called resistance training in order to make the muscles stronger. Such as weight lifting.

3) Balance exercises prevents falls. Such as Tai Chi.

4) Flexibility exercises stretch the muscles to increase flexibility. Such as yoga and pilates.
ACSM (2006) also recommended that performing exercise 3-5 times per week for 20-60 minutes each time. Moderate exercise activity level could help in maintaining physical well-being. Physical activities could also increase muscle strength and help in reduce fatigue (Dritsa, Dupuis, Lowensteyn, & Da Costa, 2009).

According to the evidence from the National Institute for Health and Clinical Excellence in England (2007), it recommended in their guidance on the management of perinatal mental health that physical exercise should be considered as a treatment for postpartum women with mild or moderate depression. It also suggested that exercise positively influence mood in new mothers. Moreover, the new physical activity guidelines “Start Active Stay Active” published by the Chef Medical Officers in the UK (2011) stated that the essential element in promoting mental health and maintaining well-being is actively participate in physical activity. Epidemiological research suggested that there were positive effects of exercise on depression (Demissie et al., 2011). In the management of depression, regular exercise seems to be effective, specifically in as a treatment for postpartum women.

The acceptance and recognition of exercise as an effective treatment for depression among general population are increasing (Daley, MacArthur, & Winter, 2007). Epidemiology research suggested that physical activity could reduce the depressive symptoms by developing the general sense of well-being (Demissie et al.,
By performing physical activities, the level of serotonin in the brain would be increased, that helped in relieving mild depressive symptoms (Liaw, 2008). In Hong Kong, Chinese culture places great importance on postpartum preservation. It emphasis that women should uptake high-calorie food and stay at home for the first month postpartum (Ko & Chen, 2010). A review in Taiwan supported that women has excess body weight gained 6% and decreased fitness after childbirth. It caused negative association with psychological well-being after delivery (Huang & Dai, 2007).

In Hong Kong, postpartum exercise such as pelvic floor and back and abdominal exercise would be introduced during antenatal or postnatal check up by mainly distributing the leaflets with brief explanation by midwifes in MCHC (Family Health Service of the Department of Health, 2008). However, there is no protocol of physical activities established as treatment of postnatal depression in Hong Kong.

1.3 Objectives and Significance

Impact of Postnatal Depression

Postnatal Depression is common and potentially causes great impact. However, only 10% of depressed mothers in developing countries will receive treatment eventually (Lee & Chung, 2005). A Hong Kong study revealed that about 10-20% of
local women were affected at 6 weeks postnatal (Chan & Levy, 2004). Many are still
depressed at 1 year postpartum if untreated (Lee & Chung, 2005). PND affects both
physical and psychological well-being of women. This morbidity not only affecting
the mothers but also has health consequences on their children and family (Marcus,
2009; Chan & Levy, 2004).

Evidence shows that PND may lead to marital stress that caused separation or
divorce (Chan & Levy, 2004). PND caused avoidance of attachment and security that
impaired maternal-infant interaction. In consequence, it adversely affected the
cognitive and emotional development and social behavior of their children (Beck,
1995).

Objectives

Our goal is to support the mothers after delivery maintain postnatal
well-being, which is a complex issue, recognized by major changes in physical,
psychosocial and emotional health. PND is a non-psychotic depressive
episode and it usually occurs 6 weeks to 48 weeks postpartum (Chan &
Levy, 2004; Lee & Chung, 2005). The target population of this study is defined as
postpartum women had either screened by the EPDS (≥ 10) as suggested by AAP
(2010) that referral of treatment should be initiated with this cutoff point; or mild to
severe depression diagnosed by physician at 6-48 weeks after delivery. Prompt
recognition and early treatment are essential to reduce its severity and impact. It is worthwhile and deserved to consider the novel treatments in managing PND.

With reference to the studies reviewed (Demissie et al., 2011; Dritsa et al., 2009; Liaw, 2008; NICE, 2007), the effectiveness of physical activities in reducing the depressive symptoms of postnatal depressed women was explored. The components of different types of physical activities in the studies under review were analyzed. An appropriate intervention was then developed based on the findings of the studies. When developing the intervention guideline, the type of exercise, the number of session, the length of each session, and follow ups were also taken into consideration.

The research question for this study was as follow:

How effective of physical activities in reducing depressive symptoms of postnatal depressed women compared to no regular physical activities?
CHAPTER 2: CRITICAL APPRAISAL

This chapter introduces factors in the study selection such as inclusion and exclusion criteria, keyword search strategies, and appraisal strategies. It also presents with the table of evidence, quality assessment, summary and synthesis of the selected studies.

2.1 Systematic Review

A comprehensive literature review was conducted for this study using electronic searching and reference searching. Three databases were used in the electronic research: PubMed (earliest to 2013), CINAHL Plus (1937-2013), and PsycINFO (1800s to 2013).

Inclusion and Exclusion Criteria

Selection criteria were set to select eligible studies. The inclusion criteria were: (1) primary studies; (2) studies with full text; (3) studies that focused on depression during the postnatal period; (4) interventional studies using the physical activities to reduce depressive symptoms; (5) low or moderate intensity exercise; (6) PND usually occurs 6-48 weeks after delivery (Chan & Levy, 2004; Lee & Chung, 2005), therefore participants included in the studies were between 6-48 weeks postpartum; (7) As teenage pregnancy usually associated with multi-psychosocial
problem (Hoffman & Maynard, 2008), age of participants included in the studies should be above 18.

Studies were excluded if they: (1) were review studies or meta-analysis and (2) employed intervention for prevention of PND.

**Data Extraction**

Studies were search by using the keyword search strategy and screened the title and abstract identified. Full articles of any possibly relevant articles were retrieved for more detailed evaluation. If the study fulfilled the inclusion and exclusion criteria, the eligible studies would be selected. Relevant information from the eligible studies were extracted, a table of evidences was then formulated in order to facilitate analysis of the findings.

**Appraisal Strategies**

Quality assessment of the eligible studies was performed using the Scottish Intercollegiate Guidelines Network (2013) checklist for critical appraisals. The Controlled Trial methodology checklists were used. The studies were given a quality rating of high, acceptable, or low based on the criteria listed in the critical appraisal checklist. In the SING checklist, the top part of the form would help to identify the study and link it to the particular guideline and key question to the
relevant study. The reminders of factors in the checklist facilitate in critically appraise the quality of the selected articles.

**Search History**

The electronic search in PubMed and CINAHL Plus was done on 2 March 2013, and the search in PsychINFO was done on 18 August 2013. No year limit was set in order to include as much relevant literature as possible. In the initial search process, 1179 publications were identified using a combination of the keywords: postnatal depression or postpartum depression or postnatal blues or postpartum blues, and physical activity or physical therapy or physical treatment or exercise. After the key word search, there are 503 publications from PubMed, 345 from CINAHL Plus and 331 from PsychINFO. The initial search was based on the identifications of articles containing the relevant keywords. After screening the titles 36 potential articles were selected. Applying the inclusion and exclusion criteria to their abstracts resulted in the elimination of 11 articles, leaving 25 articles left. Then the articles were reviewed and screened for duplication by full text to determine their suitability. 7 eligible studies were yielded. The reference lists of all selected articles were searched manually for further relevant articles. The reference lists in the review studies were also inspected for relevant studies. 7 articles were selected for analysis. A summary of the search history is illustrated by a flow diagram (Appendix A).
Table of Evidence

The articles after the electronic database search were then screened by the inclusion and exclusion criteria. Seven studies were yielded in the end. Relevant information from these seven studies were extracted, a table of evidences was then formulated. Information in the table of evidences included study type, evidence level, patient characteristics, number of subjects, intervention, comparison, length of follow up, outcome measures and effect size. The evidence tables were arranged in chronological order of the published year of the studies. Each of the studies was given an evidence level based on the eight-level hierarchies of evidence described by Scottish Intercollegiate Guidelines Network (2011). The level of evidence was rated based on the study design. The evidence table is presented in Appendix B. Also the detailed critiques of each study by using the SIGN checklists are given in Appendix C.

2.2 Description of the Studies Reviewed

Study Characteristics

Among these seven articles, five were randomized controlled trials (RCTs), one was controlled trail and one was quasi-experimental study. They were carried out in various countries: three from Australia, one from England, one from Canada, and two from Taiwan. The sample size varied from 20 to 135 participants, in
hospital, community or home settings. The length of follow-up ranged from half
month to 6 month. The publication years were from 2003 to 2013. All these studies
used quantitative methods. Five studies screened using the EPDS prior to trial entry,
while two studies used EPDS to categorize the participants after trial entry. The
sample characteristics in all studies were summarized. The majority of sample was
aged 21-38, in a married or co-habited relationship and had between one and two
children. They were postpartum 6-48 weeks with no medical condition. Their EPDS
score were \( \geq 10 \) in all studies and 50-60% of samples were receiving
pharmacological or psychotherapy in four studies (Armstrong & Edwards 2003;
Armstrong & Edwards, 2004; Heh, Hang, Ho, Fu, & Wang, 2008; Daley et al.,
2008).

Among these seven studies: three studies were community-based exercise
programme (Armstrong & Edwards 2003; Armstrong & Edwards, 2004; Ko, Yang,
Fang, Lee, & Lin, 2013); Two studies were hospital-based (Heh et al., 2008;
Norman et al., 2010); and two were individualized home-based exercise programme
(Daley et al., 2008; Da Costa et al., 2009).

Community based-programme was defined as physical activities developed
for the participants exercise as a group in a community setting, for example, the park
nearby their residence or community centre. There were two studies (Armstrong &
Edwards 2003; 2004) working by the same team of researchers, they evaluated community based pram-walking. One (Ko et al., 2013) was evaluated the low to moderate intensity exercise programme which led by a professional coach.

Exercise programmes that mainly carried out in the hospital were classified as hospital-based programme. Participants may attended group exercise sessions in the hospital then followed by voluntary self-practice at home. One study (Heh et al., 2008) involved a stretching exercise programme held at a hospital followed by phone calls to encourage exercise compliance at home; and the other study (Norman et al., 2010) evaluated the exercise and parenting education programme.

Home based-programme was classified as individualized exercise consultation and practice at home. Participants attended individualized exercise consultation in community centre but exercise at home is included. For home-based programme, two studies (Daley et al., 2008; Da Costa et al., 2009) offered an individualized home-based exercise consultation that coached by an exercise physiologist with follow-up support sessions or phone calls for exercise encouragement.

Among these seven studies, one study (Armstrong & Edwards, 2003) exercise plus social support compared with social support only. In the study of Norman et al., (2010), it compared exercise plus education with education only
group. Four studies (Armstrong & Edwards, 2004; Heh et al., 2008; Daley et al., 2008; Da Costa et al., 2009) compared exercise with no exercise usual care comparison groups. And only one (Ko et al., 2013) compared the pre- and post exercise effect within the same group. All studies evaluated interventions of 12-weeks duration and included an assessment of PND using EPDS but not necessarily as a primary outcome. In four studies (Armstrong & Edward, 2003; Armstrong & Edward, 2004; Heh et al., 2008; Daley et al., 2008) participants were able to receive concurrent antidepressant medication and/or psychological therapies, two studies (Da Costa et al., 2009; Norman et al., 2010) excluded participants if they were concurrently using antidepressants or had received psychotherapy in the previous year and one study (Ko et al., 2013) did not provide this information.

Follow-up time in five studies (Armstrong & Edward, 2003; Armstrong & Edward, 2004; Daley et al., 2008; Norman et al., 2010; Ko et al., 2013) was three months immediately post intervention. One study (Heh et al., 2008) follow-up took place approximately four months after intervention. And one study (Da Costa et al., 2009) the final assessment of outcomes took place 6 months from baseline. All studies showed significant difference in EPDS score post-intervention. Outcome measures of all studies were categorized in Appendix D.
Methodological Quality

All seven studies were clearly focused on the question, and on the objective of physical activities as an effective way of reducing depressive symptoms of PND in their target groups.

For the five RCT studies (Armstrong & Edward, 2003; Armstrong & Edward, 2004; Daley et al., 2008; Da Costa et al., 2009; Norman et al., 2010), they had clear description of the random allocation of samples. The participants were allocated to intervention and control groups by a computerized block randomization procedure sequence with sealed opaque envelope. This ensured equal distribution of participants. Controlled trial (Heh et al., 2008) and quasi-experimental design (Ko et al., 2013) were used in the two studies, no randomization were done.

Double blinding was impossible in the intervention, as the healthcare professionals had to carry out the treatment of the group assignment. Only one study (Heh et al., 2008) clearly stated the outcome assessors were blinded to participants’ group allocation. Also due to the nature of the intervention, blinding of participants was not possible.

Five studies (Armstrong & Edward, 2004; Daley et al., 2008; Heh et al., 2008; Da Costa et al., 2009; Ko et al., 2013) stated clearly the components of the intervention groups to compare with the standard of care in the control group. Two
studies (Armstrong & Edwards, 2003; Norman et al., 2010) investigated the
coeffect of physical activities together with social support or parenting education.
The control groups received the social support calls or parenting education only for
comparison. The intervention components themselves seem to be the only difference
between the intervention and control groups. However, the results of the two studies
with combined intervention (Armstrong & Edwards, 2003; Norman et al., 2010)
should be cautiously analyzed.

All relevant outcomes in all the studies were measured in a standard, valid,
and reliable way with reported validity and reliability of measurement tools. EPDS
was used in all studies, it is a commonly used tool specially designed for PND.
Statistical analyses of the results were clearly presented. The drop out rates in the six
studies ranged from 3.7 % to 20.8%. Only one study (Armstrong & Edwards, 2003)
did not mention about the drop out rate. Most dropout rates were considered to be
acceptable with effective statistical power. The intention to treat analysis was well
covered in three studies. The papers reviewed are summarized and presented in the
form of quality assessment tables (Appendix E). Overall, four studies achieved high
quality rating and three studies were medium quality rating.
2.3 Summary and Synthesis

When compared with no-exercise, intervention involving exercise significantly reduced symptoms of postnatal depression (p<0.05) as reflected in all seven studies. There was a substantial reduction in EPDS scores in participants received the intervention. The reduction was maintained until follow up. All studies implemented the intervention 6 weeks to 48 weeks postpartum. The components of different types of physical activities in the studies under review were analyzed. The type of exercise, the number of session, the length of each session, and follow ups were also taken into consideration.

Types of Physical Activities

Community based-programme (n=3). The effect size reduced from -10.10 (95% CI: -13.17, -7.03, p<0.01) to -6.71 (p=0.021). In these three studies, group pram-walking exercise and low to moderate intensity exercise programme such as yoga and pilates were being evaluated. One to two times per week and each session last for 30-60 mins for 12 weeks. The adherence rate of the programme was 66% to 82.1%.

Hospital based-programme (n=2). The effect size reduced considerably from -2.64 (95% CI: -4.37, -0.61, p=0.01) to -2.53 (p<0.001). They included group moderate intensity such as stretching and baby-involved programme. It was 8 and 12
week programme that included 1-2 sessions per week for 45-60 mins. Also the adherence rate of the programme was 82% to 85%. A reminder call was made weekly for home exercise encouragement.

**Home based-programme (n=2).** The effect size reduced from -4.06 (95% CI: -6.61, -1.51, p<0.001) to -1.6 (95% CI: -5.2, -2.32, p<0.005. They were an individualized programme consisted of moderate intensity exercise. Five sessions per week each session was 30 mins for 12 weeks. Average adherences were 76.1% and engaged in 174 mins of exercise per week.

**Comparison between Community, Hospital and Home-based Programmes**

In all seven studies, participants of intervention and control groups share similar characteristics. They all were practicing low to moderate intensity exercise which was classified as 60-85% of MHR by ACSM. In general, community-based and home-based exercise interventions have been shown more significant result. The highest adherence rate was found in hospital-based programme. As there was a reminder call made weekly for home exercise encouragement in hospital-based programme, it found to be effective in promoting the intervention adherence. In the two trails studying community-based programmes, the reasons of not attending the sessions were mainly childcare and sickness. These were essential factors that need to be considered when designing the exercise programme for women with PND.
Pram-walking, gentle stretching exercise, yoga and pilates were being evaluated. The results showed that pram-walking exercise with moderate intensity reduced the EPDS score of 10.2 and 7.08 (p<0.05). The studies conducted by Da Costa et al. (2009) and Ko et al. (2013), the exercise programme was led by professional coach and physiologist. Interventions were led by other healthcare professionals in the rests of the studies.

From the seven trials, there is a direct association between improvements in fitness, which was suggested to be related to the reduction in depression levels for the exercise group. All studies with exercise only reported a significant improvement in depressive symptoms. In the quasi-experimental design study (Ko et al., 2013), it yielded a significant result also (-6.71, p=0.021) for the higher EPDS score (≥15) group. However, 50-60% of the study sample receiving counseling or taking medication at the same time. It revealed that other factors in combination with improvements in fitness influenced improvements in depression levels. In the study of Da Costa et al. (2009), with evidence level: 1++. The inclusion criteria of this study was set to be no psychotherapy or psychiatric care received from the participants. It found out that exercise can reduce the postnatal depressive symptoms from -4.06 (95% CI: -6.61, -1.51, p<0.001). The result represented that exercise is a feasible non-pharmacological intervention to reduce postpartum depressive
symptoms.

The length of follow ups in all studies was mainly 6 and 12 weeks from baseline. For women with PND, factors such as childcare, fatigue and travel time may reduce their opportunities and enthusiasm for exercise (Daley, MacArthur, & Winter, 2007). Therefore, home-based (Dritsa et al., 2009) is more feasible to alleviate postpartum depressive symptoms, especially in women with higher initial depressed mood scores as measured by EPDS.

To conclude, exercise participation is likely to be beneficial to postnatal depressed women. Exercise seems to be plausible to be considered as a therapeutic option, particularly to those women reluctant to take medication and the limited availability of psychological therapies. A large study that compares exercise with standard treatment, and which includes longer time of follow-up is worthwhile in recommendation for current health care settings. In developing exercise intervention, there was greater consistency of effect when there were four or more contacts between the one delivering the treatment and the participants. Also a mixture of professional guidance and self-directed exercise would lead to a more significant effect. Together with on-going support by reminder telephone calls facilitate a more successful result. Different types of exercise interventions had been used in previous studies involving individualized home base exercise; community based group
pram-walking exercise and supervised exercise classes in hospital. All types of interventions showed significant result, but home based exercise intervention is more convincing as it is low cost. It is particularly suitable for those required significant travel time. A home-based programme involving consultations and phone calls was seemed to be viable.
CHAPTER 3: IMPLEMENTATION POTENTIAL AND EBP GUIDELINE

3.1 Implementation Potential of an Evidence-based Innovation

Target Setting/ Audience

Target setting

The study is carried out in Maternal and Child Health Centres (MCHCs) in Hong Kong. MCHCs provide public health services to over 90% of newborns until 5 years old (Leung et al., 2010). Having reasonable coverage of newborns in HK, MCHC provides an unstigmatized platform to access families with psychosocial stress, including those hard to reach. They provide services for the varied needs of children and their families by timely referral to appropriate services for intervention.

Target audience

The target audience for this physical activity intervention will be defined as the women with postnatal depression under the care of Maternal and Child Health Centre (MCHC) in Hong Kong. They will be recruited from the pool of mothers who are identified as postnatal depression (PND). Routine screening for PND by Edinburgh Postnatal Depression Scale (EPDS) is carried out in the MCHC when women are 6-12 weeks after delivery. This routine screening is done by the nurses currently in the MCHC. Postpartum women had either screened by the EPDS (≥ 10) as suggested by AAP (2010) are considered to have PND, that referral of treatment
should be initiated with this cutoff point. PND is a non-psychotic depressive episode and it usually occurs 6 weeks to 48 weeks postpartum (Chan & Levy, 2004; Lee & Chung, 2005). Therefore mild to severe depression diagnosed by physician based on The Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013), which is used by mental health providers to diagnose mental conditions, at 6-48 weeks after delivery will also be invited to join the intervention. Prompt recognition and early treatment of PND are essential to reduce its severity and impact.

Transferability of the Findings

To determine if the findings from the studies conducted in Western countries can be transferred to the local setting, it is important to understand the prevalence rates in Western and Chinese populations. According to Australia National Health and Medical Research Council (2000), the estimated average prevalence of postnatal depression is around 13-15%. For Western population, the averages rate of postnatal depression is 10-15% (Mallikarjun & Oyebode, 2005). More than 50% of postnatal women reported that there are elevation of depressive symptoms at some point in the first month after delivery, and 6.5% of women are depressed at 12 months postpartum (Demissie et al., 2011). There were only a few studies reviewed the psychiatric morbidity in Chinese population. The prevalence rates of postnatal
depression among Chinese women in Hong Kong and Taiwan was 0.9-2.4% in the past (Chen et al., 1993; Hwu, Yeh, & Chang, 1989). However, the recent epidemiological studies reported that 10-20% of Chinese women are affected by postnatal depression (Chan & Levy, 2004; Gao, Chan, Li, Chan, & Hao, 2010). These reflected that there is a rising trend of women suffering from postnatal depression among Chinese population. Also the studies showed that the prevalence rates in Western and Chinese societies are similar, indicating that both populations shared similar needs for interventions. It seems to be possibly transferred the interventions from overseas studies to local settings.

**Characteristics of the target audience**

The target audience for this intervention shares similar characteristics to those included in the studies reviewed. The majority of sample among these 7 studies was aged 21-38. According to Census and Statistics Department in Hong Kong (2012), evidence showed that fertility women in Hong Kong are aged 25-39. In order to benefit a greater number of women, all eligible women aged 18 or above will be recruited. As teenage pregnancy usually associated with multi-psychosocial problem (Hoffman & Maynard, 2008), an age limit is set at 18 years in order to exclude women with teenage pregnancies.
There will be no restriction on primiparous or multiparous women since they share similar percentages in the reviewed studies. Women with medical condition were excluded same as all studies reviewed, as it would probably affect the clinical outcome of the physical activity intervention (Da Costa, Drista, Lowensteyn, & Rippen, 2006).

**Clinical setting**

As reviewed in the previous studies, a home-based physical activity intervention would be more preferable (Dritsa et al., 2009). For women with PND, complications such as childcare responsibilities, fatigue and breastfeeding routines may reduce their opportunities and enthusiasm for exercise, particularly if they involve significant travel time (Daley, MacArthur, & Winter, 2007). Home based-programme was classified as individualized exercise consultation and practice at home. Participants attended individualized exercise consultation in community centre but more importantly they are exercising at home is considered as home-based programme (Dritsa et al., 2009).

It is for these reasons MCHC is an appropriate community centre for participants attend the individual consultations. The setting in MCHC can entertain this population to participate and follow up the intervention. It will facilitate the participant to join the intervention during child health visit in the MCHC. A
conference room is available in the clinic, which can be provided adequate space for the pram-pushing exercise demonstration and practice. This room has been used for health education and group sharing. This target setting has been chosen because it is easily accessible to the target participant and the necessary equipment, such as a computer, projector, DVD player is readily available.

Philosophy of care

For the current practice in Hong Kong, Maternal and Child Health Centres (MCHCs) was a platform to provide a comprehensive and integrated service to children and their families. MCHCs jointly cooperated with hospitals of the Hospital Authority (HA) and Integrated Family Service Centres (IFSCs) provide a Comprehensive Child Development Service (CCDS), which aiming to ensure early identification of the varied needs of children and their families was commenced in 2005 (Leung et al., 2007). In order to identify and manage mothers with PND, mothers after delivery would be routinely screened for PND in MCHCs using the Edinburgh Postnatal Depression Scale (EPDS). Counseling services for example cognitive behavioral therapy would be provided by on-site psychiatric nurse in MCHCs. Referral to psychotic treatment from on-site psychiatrics was even provided for more serious cases. There would be referral services for the children of PND mothers to visit community paediatrician. Subsequent follow-up would be
provided for child development assessment. A lot of resources have been put into providing services for reducing depressive symptoms and mobilize a social support system for postnatal depressed women. Therefore, the philosophy of care underlying this intervention is fundamentally similar to the philosophy prevailing in the practice setting.

**Human resource**

The majority of intervention providers for the intervention were nurses and physicians. Nurses and physicians in the MCHC have close collaboration with the pediatricians and psychiatrists in the hospital. Thus, the plan is that nurses in MCHC will receive the training on the intervention about physical activities offered by physicians. Nurses will organize the intervention in their own setting.

**Financial or Administrative Structure**

This intervention will fit into the proposed setting. Education program for antenatal or child health care were held three times a week in the health education room at the clinic. Implementing the new physical exercise intervention is highly probable in the same setting. The necessary equipment such as a computer, projector, DVD player is readily available in the setting for implementation.

In order to equip nurses with the teaching technique on physical activities, three two-hour training workshops will be offered by physicians of MCHC. Other
administrative support, including clerical and technical support from research assistants and workman are readily available.

**Feasibility**

*Organizational climate*

Departmental services and protocols are constantly revised with updated information from research studies. Generally, the organization would support the innovation if it is evidence-based practice. The intervention does not involve the physicians for implementation. They are only involved in setting the protocol and nurses training. Moreover, if the intervention of physical activities is effective in reducing depressive symptoms of depressed women, it may reduce the need for doctor’s consultation or follow up by psychiatrists. There is possible friction among nurses. Although, routine screening and counseling is part of their routine work, organizing session of physical activities would increase their workload. In order to minimize the resistance and increase cooperativeness, training session and program of physical activities should be implemented during working hours. Also regular meetings should be held to evaluate the progress and address the concern for improvement. The organization climate is conducive to research utilization.
Consensus among the staff and Administrators

Consensus among the staff and administrators has to be reached before the implementation of the program. A meeting with the senior nursing officer is necessary to understand the main concerns of the intervention of the provider. Possible solutions have to be sorted out to prevent resistance and uncooperativeness. Ongoing staff meetings are held regularly in department enables to reach consensus according to the changing needs of both staffs and patients.

Availability of tools for a clinical evaluation of the intervention

Clinical evaluation of the intervention will be done using the following approaches: patient outcome, health care provider outcome and system outcome evaluation. Effectiveness of the intervention will be evaluated by using Edinburgh Postpartum Depression Scale. EPDS is a reliable screening tool for postpartum depression (Bunevicius, Kusminskas, & Bunevicius, 2009; The American Academy of Pediatrics, 2010). It was translated into Chinese by a team of Hong Kong psychiatrists and has been validated (Lee et al., 1998; Li et al., 2011). Therefore it will be used before and after implementation of the program. It will be repeated during follow ups at 6 and 12 weeks from baseline. The EPDS scores enable nurses to assess the improvement of the depressive symptoms.
For the health care provider outcome, nurses who conduct the intervention will also be invited to complete an evaluation questionnaire (Appendix F) to gather comments and suggestions for improvement. The feasibility of the programme for example, friendliness of the manual, adequacy of time for each session will be evaluated. The receptiveness towards the interventions by assessing the level of job satisfaction and work stress of the health care provider will also be included in the questionnaire.

In order to achieve effectiveness at an organizational level, the system outcome will be measured. The main focus will be on the adequacy and allocation of manpower, and acceptability and accessibility of resources. Participants will be asked to fill in an evaluation questionnaire (Appendix G) in terms of service expectation and the satisfaction of the intervention at the end of the programme. It is mainly assessing the improvement of the quality of the service.

Staff meeting with Senior Nursing Officers at the end of the programme is necessary to know if the present manpower level is adequate to run the program and whether more manpower is needed to sustain the programme. Also, nurses will be asked if there are sufficient resources to run the program and if the resources are readily accessible to all of them.
Cost-benefit Ratio of the Innovation

Costs of implementation

Costs of implementation include material costs and non-material costs. Material costs of implementation such as printing of pamphlets and posters for promotion, printing teaching manual for the training, photocopying of EPDS and evaluation questionnaires. There are around 850 nursing staffs in the Department of Health (2010) and roughly estimate 500 nurses are working in MCHC. On the other hand, there are also non-material costs. The personal costs of implementation include mainly the salary of the nurses that involves the man-hours required for the interventions. The average salary point ($33000) is taken for estimation. A detailed calculation of the estimated costs of implementation is given in Appendix H.

Benefits of implementation

Offering alternative treatment for the target population will help to reduce the severity of depressive symptoms. In the long run, the risk of developing future depression can be reduced, especially in subsequent pregnancies. The need for psychiatric care may also be minimized. A detailed calculation of the saved costs is attached in Appendix H.

The nonmaterial costs of depression include cost of dealing with psychological, family, marital and child development problems. From a wider
perspective, depression also exerts costs on society, in terms of loss of productivity, and increased expenditure on social welfare for the unemployed or those with family problems.

*Cost-benefit ratio*

If the intervention is not implemented in the department, there is a high possibility of increasing treatment cost for PND. The estimated benefits of implementation far outweigh the costs.

3.2 Evidence Based Practice Guideline

*Guideline Title*

Physical activities as a treatment in reducing depressive symptoms of postnatal depressed women.

*Purpose of the Guideline*

The purpose of the guideline is to assist healthcare professionals in establishing a protocol in physical activities as a treatment of postnatal depression in Hong Kong.

*Aims and Objectives of the Guideline*

The guideline has two main objectives: firstly, to support the mothers after delivery to maintain postnatal well-being; secondly, to provide evidence-based
practice in reducing depressive symptoms of postnatal depressed women by physical activities.

**Target Group**

Our target group is all new mothers aged 18 or above who attend MCHC after delivery screened by the EPDS scored more than 10; or diagnosed with mild or severe depression by physician at 6-48 weeks after delivery.

**Major Outcomes Considered**

We are looking for any reduction in the postnatal depressive symptoms by means of evidence-based physical activities programme.

**Interventions and Practices Considered**

Interventions such as assessment of PND (EPDS), one-to-one consultations, telephone calls, leaflets and videos are all considered for use.

**Recommendations**

Under “Grade of Recommendations’ (SIGN, 2013), the recommendations for healthcare professionals in providing postnatal depression treatment are as follows:

Overview of the intervention

A home-based exercise programme which is defined as participants attended individualized exercise consultation in community centre but mainly exercising at home. The programme in this study is lasts for 12 weeks. It involved two one-to-one
personalized consultations introducing pram-pushing exercise programme that lead by nurse (during week 1 and 4) in MCHC. Followed by telephone calls (during week 8 and 12) that promotes home exercising. Moreover, information leaflets are mailed monthly to the participants throughout the 12 weeks intervention period.

EPDS will be used for evaluation at week 6 and 12 from baseline. At the end of the programme, evaluation questionnaires will be filled up by participants and staffs; also a meeting for staff in particular for service improvement will be held. The detailed recommendation and intervention manual is attached in Appendix I.
CHAPTER 4: IMPLEMENTATION PLAN

4.1 Communication Plan

Communication Plan with Potential Users

Identification of Stakeholders

The crucial reason for successful implementation of an intervention is adequate support from the stakeholders. Therefore before implementation, there should be a comprehensive plan for communicating with potential users and stakeholders.

Senior administrators, physicians, nurses and clerical staffs are the essential targets for communication for the success of the programme in the MCHC. Senior administrators are responsible for the allocation of services’ needs, for example the required resources, budgets and manpower. They play a top managerial and decisive role in the MCHC. Healthcare professionals such as physicians and nurses are the frontline staffs to implement the program. Therefore they should understand, accept and support the intervention. Clerical staff is the first contact when new mothers attend MCHC and register at the counter. They should have adequate understanding of the programme in order to answer basic questions and offer information.
Communication Process

In the communication process, the Chief Family Health Officer, Senior Medical Officer, Medical Officer, Senior Nursing Officer and Nursing Officer are the administrators in the service. A detailed explanation and the process of implementation of the programme should be presented through open discussion of the proposal and budget plan. The expected benefits for the service and profession should also be well addressed. Furthermore, reassurance must be provided to the administrators that the programme will not interfere with current clinic functions. A core team member of this research will then be formed including the Senior Medical Officer, Medical Officer (Obstetrician), Senior Nursing Officer, Nursing Officer (Midwife), Physiotherapist, Occupational therapist and me. It could help to engage their support and advice on the direction of the program and to standardize practice through an EBP guideline.

Opinion and cooperation are then should be gained from those frontline staffs, including physicians and nurses. They should understand, acknowledge and support the intervention. The reason is they play an important role in providing postnatal support to the clients. The clerical staff may be the first persons to contact clients,
and should coordinate with the healthcare professionals and contribute valuable efforts during the process of intervention.

*Communication Methods*

For the informal communication method, it can soothe the atmosphere and encourage colleague to raise the suggestions for the programme. For example, the quarterly sharing session in the clinic with colleagues in order to collect the views and suggestions. Followed by monthly case conference with the core team member to discuss postnatal physical activities support and review difficult cases. As for more formal communication methods, the frontline staffs including physicians and nurses are required to write a report to acknowledge their suggestions, feedbacks and concerns.

*Sustaining the Change Process*

Effective communication with nurses in the team is important to successful implementation of the programme as to minimize resistance during the process of change. Nurses should be well versed about the aims and objectives of the program. Based on the research studies about physical activities and PND reviewed, an EBP guideline was developed. The Senior Medical Officer (SMO) will be responsible to guide nurses during the implementation. In order to train the users in the programme
by using the EBP guidelines, the Family Health Service of the Department of Health
will provide a half-day briefing session for doctors and nurses. All nurses and
doctors working in the MCHC are required to attend the whole day training course
about the pram-pushing exercise programme afterwards. It could help to ensure
there are adequate demonstration and practice for all frontline staffs. Nurses will be
guaranteed that the extra work burden will be kept to a minimum and adequate
manpower and resources will be provided.

To sustain the change process, evaluation of the training sessions and the
teaching manual will be conducted (Appendix F). Comments and feedback will be
gathered and considered. Amendments will then be made accordingly.

4.2 Pilot Study

Before introducing the programme, it will be beneficial to conduct a pilot study
with a small number of subjects (Melnyk & Fineout-Overholt, 2005). The purpose
of conducting this pilot testing include: 1) to indicate the anticipated time required to
recruit an adequate number of participants; 2) to determine the feasibility of the
intervention in order to prevent unexpected difficulties; 3) to anticipate any problem
of logistic; 4) to assess the acceptance of the participants; and 5) to gather comments
and feedback about the programme for future improvement.
Before conducting the pilot test, relevant personnel should be trained. Nurses should have received the training sessions from the SMO according to the manual. They should be able to demonstrate appropriate knowledge and skills in conducting the intervention using the physical activity approach. The SMO will be present during the pilot test in order to assess if the nurses have acquired the necessary skills and are able to demonstrate them accurately.

**Overview of the Exercise Intervention**

The exercise intervention lasts for three months. The intervention involves two one-to-one personalized exercise consultations (during week 1 and 4), telephone calls (during week 8 and 12) that promote exercise. Also, participants will receive information leaflets monthly by mail (Appendix L) throughout the 12 week intervention period.

In the pilot test, the same setting as the actual implementation will be employed. In order to make the pilot testing more like the real situation, approximately 50 women will be recruited using the same recruitment procedures as mentioned earlier. Based on the screening service offered in MCHC of the Department of Health, women who score ≥ 10 in the EPDS will be invited to join the programme. They asked to complete diary logs (Appendix K) during weeks 4, 8
and 12 of the intervention. The content of the diary logs are mainly the frequency and duration of their exercise. Logs can be completed over the phone or sent and returned by post. Follow-up telephone calls lasting about 15-20 minutes are made during week 8 and 12 of the intervention. The focus of the calls is to encourage the maintenance of an active lifestyle. At the week 6 and at the end of the 12 week program, participants will also required to complete the EPDS again. At the end of the pilot testing, the proposed changes will be evaluated in order to determine if any modifications are needed for actual implementation.

**4.3 Evaluation Plan**

The evaluation plan will include three outcome measures: (1) patient outcome; (2) health care provider outcome; and (3) system outcome.

**Patient Outcome**

The aim of the intervention is to reduce the depressive symptoms of women with postnatal depression. It will be evaluated by the use of EPDS with either English or Chinese version. As both EPDS in English (Bunevicius, Kusminskas, & Bunevicius, 2009; The American Academy of Pediatrics, 2010) and Chinese (Lee et al., 1998; Li, Liu, Zhang, Wang, & Chen, 2011) are validated as reliable screening tool for postpartum depression. It will be used before and after implementation of
the program. It will be repeated during follow ups at 6 and 12 weeks from baseline.

The EPDS scores enable nurses to assess the improvement of the depressive symptoms.

The EPDS is one of the best known screening tools for PND. It has been widely used and evaluated by health care providers in Western countries. It was translated into Chinese by a team of Hong Kong psychiatrists and has been validated (Lee et al., 1998; Li et al., 2011). The translated EPDS has excellent psychometric properties in screening for depressive illness at six weeks postpartum. According to Lee et al., (1998), for screening purpose a cut-off point 9 or 10 is commonly used. At this score, the sensitivity and specificity is 0.82 and 0.86 respectively. Overall, the translated Chinese version EPDS is validated as a satisfactory instrument for screening PND in Chinese women.

Data Analysis

Data will be collected during the 6-week postpartum checkup of the EPDS screening. In this study, a cut-off score of 10 will be used, which is the score used in the existing screening program in the MCHC. Women are invited to join in the program in order to reduce their depressive symptoms. Patient outcome will be considered to have improved if the participants have a decrease in EPDS score by 2
compared to the score before the commencement of the programme (Daley et al., 2008).

Participants are required to complete diary logs during weeks 4, 8 and 12 of the intervention. The content of the diary logs are mainly the frequency and duration of their exercise. It can reflect the compliance of the participants to the programme. Participants performed accumulating 30 minutes of pram-pushing exercise on three days per week will be considered as good compliance (American College of Sports Medicine, 2006).

Process evaluation will be conducted in order to gather information for future improvement. Process evaluation documents and analyzes the early development and actual implementation of the programme, assessing whether it has been implemented as planned and whether the expected output has actually been achieved. The overall goal is to provide information that can be used to assess the program’s strengths and needs for improvement, and document perceptions of effectiveness that can be used to sustain the program. The primary method for process evaluation will consist of evaluation questionnaires (Appendix G) to be completed by participants. It will be distributed to all participants or by post at the week 12. Data
will then be analyzed to determine the strengths and needs of the program, and areas for improvement.

**Nature and Number of Clients involved**

*Eligibility Criteria*

All new mothers aged 18 or above who attend MCHC after delivery screened by the EPDS scored more than 10; or diagnosed with mild or severe depression by physician at 6 weeks after delivery.

*Sample Size Calculation*

Based on the studies reviewed (Armstrong & Edwards 2003; Armstrong & Edwards, 2004; Heh, Hang, Ho, Fu, & Wang, 2008; Daley et al., 2008; DaCosta et al., 2009; Norman et al., 2010; Ko, Yang, Fang, Lee, & Lin, 2013), the range of effect size is 0.29 to 0.6. The mean 0.45 from this range would be considered as the effect size of this study. A sample of 38 participants will be sufficient to detect a 1.2 unit difference in EPDS score. To calculate the sample size, with the alpha=0.05, power=0.95 and effect size=0.5. The sample size is calculated to be 42, meaning 42 clients will constitute to be the sample of this pilot test. As predicted a 15% potential loss (7 clients), and so the total sample size round up to be 50. According to the
Evaluation Report of Comprehensive Child Development Service conducted by the Family Health Service under the Department of Health in Hong Kong, the monthly average number of mothers with probable PND (EPDS score ≥ 10) identified was 24.6 (Leung, Leung, Chan, Lee, & Ip, 2007). The estimated period for recruitment is around two to three months.

**Health Care Provider Outcome**

To evaluate the health care provider outcome, it is important to look at the feasibility of the programme and receptiveness towards the intervention. Nurses who conduct the intervention will also be invited to complete an evaluation questionnaire to gather comments and suggestions for improvements. An evaluation questionnaire has been specifically designed for nurses (Appendix F). The feasibility of the program for example, friendliness of the manual, adequacy of time for each session will be evaluated. The receptiveness towards the interventions by assessing the level of job satisfaction and work stress of the health care provider will also be included in the questionnaire.

Nurses will be asked to complete the evaluation questionnaire (Appendix F) after conducting the programme. Data collected from the Likert scale will then be analyzed. The level of satisfaction with this intervention among both participants
and healthcare providers is an indicator of its effectiveness. Evidence of a successful outcome is taken to be 80% of participants (Gwet, 2010) in the programme choosing ‘agree’ or ‘strongly agree’ options in the participants and healthcare professionals evaluation questionnaires (Appendix F and G). Open-ended answers will be concluded and summarized into descriptive data. After that the degree of effectiveness will be concluded by the Senior Medical Officer.

**System Outcome**

In order to achieve effectiveness at an organizational level, the outcome will be measured. The main focus will be on the acceptability and accessibility of resources, and adequacy on allocation of manpower. The acceptability and accessibility of resources of the service to the clients can be reflected through the number of client accepting or declining to join the programme. Also it can be reflected by the number of clients defaulting appointment with participating the consultation held in MCHC and client feedback. The evaluation meetings will be held at the end of the program. The participants will be encouraged to verbalize their concerns in terms of service expectation and the satisfaction of the intervention during the evaluation meetings. The core team members and relevant clerical staffs will be involved in the evaluation as well. It is mainly assessing the improvement of the quality of the
service. These could help in determining areas for improvement and the need for further support in running and sustaining the programme.

There will be discussion about the adequacy of present manpower and resources allocation. Information collected at the meeting will be reviewed and considered for future improvements.

Finally, the costs would be compared. The initial set-up cost and the final expenditure in running the programme would be compared for better financial planning for future runs of the programme. Moreover, the current expenditure on the medical treatment for depressed women and psychosocial support such as expenditure on community psychiatric nursing would be compared with the expenditure of this programme to determine the cost-benefit ratio.

**Data analysis**

Descriptive statistics will be used to descriptive the basic features of the data collected from the interventional study. In this study, descriptive statistics will be reported for baseline demographic, clinical, and health status variables. These data will provide simple illustrations of the study sample and the measures.
Significance Testing: Repeated Measure ANOVA

To test for the effect of the intervention over time, a repeated measure ANOVA analysis will be used. The aim for this statistical analysis is to determine the effect of the physical activities intervention on the level of depressive symptoms over time. In order to test for the effect of the intervention over time, therefore data would be collected at three time points. The data consists of repeated measures on the same units that are comparing the EPDS scores for the same group of women before (postpartum 6 week) and after the intervention (postpartum 12 week and 18 week). The null hypothesis is that there is no difference between means of the pre- and post-intervention scores. The null hypothesis will be rejected when there is a different of the result after the ANOVA analysis. Therefore the intervention would be considered as effective.

4.4 Conclusion

Postnatal Depression is classified to be a major public health problem (National Health and Medical Research Council, 2000). This study, with the aim of identifying an effective intervention for PND and developing an intervention manual, began with a systemic literature review. Then, with careful consideration about the implementation potential, a physical activities program was developed. A detailed
implementation and evaluation plan were explained. Findings suggest that the
intervention is reasonably possible and efficacious for implementation in MCHC. In
order to anticipate the feasibility of implementation, a pilot study will be conducted
prior to actual implementation of the programme.
Appendix A
Search History

By keyword search:
1. Postnatal depression OR postpartum depression OR postnatal blues OR postpartum blues

Reviewed by titles
15 articles
13 articles
8 articles

Reviewed by abstracts
13 articles
7 articles
5 articles

Reviewed by full papers and reference lists
6 articles
5 articles
5 articles

Total articles for review after elimination of duplication: 7
## Appendix B

### Table of evidences

The Effectiveness of Physical Activities in Reducing Depressive Symptoms of Postnatal Depressed Women

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Evidence Level</th>
<th>Patient characteristics</th>
<th>Intervention(s)</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armstrong K, &amp; Edwards H, 2003</td>
<td>Randomized Control Trial</td>
<td>1 (++)</td>
<td>-Postpartum (6-48wks) -EPDS ≥12 -Age 21-30 -Married or cohabited -Parity:1-2 -No medical condition -50% taking antidepressant or receiving counseling</td>
<td>-Community-based -Group pram-walking sessions at moderate intensity (60-75% age-predicted HR) for 30-40 minutes three times per week plus one social support session per week for 12 weeks. -Exercise log -Average attendance:66% • Sick child 61% • Sickness 15% • Work 5% • Holiday 8% • Other 11% (n=10) *Group size did not mention in the study</td>
<td>-Social support call at week 6. (n=10)</td>
<td>-1.5-month -3-month</td>
<td>Psychological well-being (1)EPDS score (2)DASS (3)GHQ-12 Fitness (4)Borg Scale</td>
<td>(1)EPDS: -10.10 (95% CI: -13.17, -7.03 P&lt;0.01) (2)DASS: F=1.93 (p&gt;0.05) (3)GHQ-12: F=0.48 (p&gt;0.05) (4)0.013 (p&lt;0.01)</td>
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<td>Armstrong K, &amp; Edwards H, 2004</td>
<td>Randomized Control Trial</td>
<td>1 (+)</td>
<td>-Postpartum (6-48wks) -EPDS ≥12 at Both screening and study entry -Age ~30 -Married or cohabited -Parity: 1-2 (80-91%) -No medical condition -50-60% taking antidepressant</td>
<td>-Community-based -Twice weekly pram-walking group over 12 weeks for 40 minutes at moderate intensity (60-75% age-predicted HR). -Participants encouraged to do third pram-walking session in their own time each week -Average attendance: 75% • Sick child 61% • Sickness 15% • Work 5% • Holiday 8% • Other 11% (n=12) *Group size did not mention in the study</td>
<td>-Social support intervention once per week over 12 weeks -Average attendance: 73% (n=12)</td>
<td>-1.5-month -3-month -6-month</td>
<td>Primary Outcome: (1) Psychological well-being -EPDS score (2) Psychological well-being and time -EPDS and time (3) Fitness -Borg Scale Secondary Outcome: (4) Social Support Level -SSI</td>
<td>(1)-7.00 (95%CI: -12.35, -1.65 p&lt;0.05) (2) EPDS and time • Intervention F=12.17 (p&lt;0.001) • Control F=3.78 (p&gt;0.05) (3)5.9 (p&lt;0.01) (4)0.49 (p&gt;0.05)</td>
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<td>Controlled</td>
<td>2 (++)</td>
<td>-Postpartum (6wks) &lt;br&gt;-EPDS ≥10 &lt;br&gt;-Age: 20-35 &lt;br&gt;-Married &lt;br&gt;-NSD &lt;br&gt;-Full term health baby &lt;br&gt;-Parity: 1 &lt;br&gt;-No psychiatric history and obstetric complications.</td>
<td>-Hospital-based &lt;br&gt;-Exercise support guide was given at start: a 45-minute, whole body, gentle stretching exercise program and CD record. &lt;br&gt;-One hour weekly group exercise with 4-6 women and two home sessions following the exercise guide for three months. &lt;br&gt;-Weekly reminder call for home exercise. &lt;br&gt;-Exercise log &lt;br&gt;-Adherence: 82% (n=35)</td>
<td>-Usual care &lt;br&gt;-Exercise log (n=33)</td>
<td>-5-month</td>
<td>1)EPDS score (95% CI: -4.37, -0.61, p=0.01)</td>
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<tr>
<td>3</td>
<td>Heh SS, et al., 2008</td>
<td>trial</td>
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|   |    | Randomized | 1 (+) | -Postpartum 48 weeks <br>-EPDS ≥ 12 <br>-Age: 29-31 <br>-Parity: 1 (66.6-80%) <br>-Married or cohabited | -Home based 5 days per week 30 minutes daily moderate intensity exercise for 3 months <br>-Two monthly individualized one hour exercise consultations: <br>(1)First consultation: <br>-Demonstration of pram-pushing <br>-Motivate and develop exercise goal <br>(2)Second consultation: <br>-Maintain adherence <br>-10 minutes phone follow up at week 3 and 9 for regular exercise promotion was given. <br>-Average Adherence: Participants engaged in 174 minutes of exercise per week. (n=20) | Usual care (n=18) | -3-month | Primary Outcome: <br>(1) EPDS score <br>Secondary Outcome <br>(2) Self-efficacy for exercise <br>(1)-1.6 (95% CI: -5.2, 2.32, p<0.05). <br>(2) 4.1 (95% CI: 1.6, 6.4, p<0.05).  | 4 | Daley, A., et al., 2008 | control trial | | | | | |
|   | Da Costa et al., 2009 | Randomized control trial | 1 (++) | Postpartum (4-38wks) | EPDS ≥10 | Age:32-35 | Parity:1 (33.3-43.4%) | No history of chronic depression | No psychotherapy in past year | Individualized home-based 12-week exercise program | Physiologist visit 4 times (at start then week 1, 3 and 9) during intervention for exercise prescription (moderate intensity i.e 60-85% age-predicted HR) and guidance | Exercise log | Adherence: 76.1% (n= 46) |
|   |   |   |   | Standard care (n=42) | -3-month -6-month | (1) EPDS score (2) HAM-D (immediately post intervention and 6 months from baseline) | (1)-4.06 (95% CI: -6.61, -1.51, p<0.001) (2)-1.83 (95% CI: -3.41, -0.24, p=0.02) |
| 5 | Norman, E. et al., 2010 | Randomized control trial | 1 (++) | Postpartum (6-10 weeks) | EPDS≥13 (22% of intervention group; 16% of control group) | Parity: 1 (63-68%) | Not receiving psychiatric care | Hospital based 8-week one hour weekly baby-involved exercise program which included cardiovascular and strength components. | -30-minute parenting education. | Written parenting material. | Adherence: >85% (n=62) |
|   |   |   |   | Standard care (n=73) | -2-month -3-month | (1)PABS (2)EPDS score (3)Fat loss | (1)1.1 (p<0.007) (2)-2.53 (p<0.001) |
| 6 | Ko, Y.L. et al., 2013 | Quasi-experimental | 2 (+) | Postpartum (6 weeks) | EPDS mean 12.48 ±8.45 | 30.5% ≥15 | Aged:29-38 | Parity: 1 (52.2%) | No maternal or neonatal complication | Community-based | ‘Contemporary Postpartum Exercise Programme’ at 2–6 months postpartum (1) Yoga and pilates exercise (2) Low intensity exercise | Group exercise once a week for one hour each time and for a three-month period (12 sessions in total). | The exercise programme was led by a professional coach | Adherence: 82.1% | Transportation | Childcare | (n=28) |
|   |   |   |   | Standard care | -3-month | (1)EPDS score a.≤14 (n=16) b.≥15 (n=7) (2) FSC (3)Fat loss | (1)a. -0.44 (t=0.294, p=0.772) b. -6.71 (t=3.113, p=0.021) (2)-1.39 (t=1.222, p=0.234) (3)-1.62 (t=6.227, p<0.001) |
## Methodology Checklist 1: Controlled Trials

**Guideline topic:** Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.

**Key Question No:**

**Reviewer:**

**Before** completing this checklist, consider:

1. **Is the paper a randomised controlled trial or a controlled clinical trial?** If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a controlled clinical trial questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

2. **Is the paper relevant to key question?** Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

### Reason for rejection:

1. **Paper not relevant to key question**
2. **Other reason** (please specify):

### Section 1: Internal validity

**In a well conducted RCT study...**

<table>
<thead>
<tr>
<th>Question</th>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 The study addresses an appropriate and clearly focused question.</td>
<td>Yes ☑ No ☐ Can't say ☐</td>
</tr>
<tr>
<td>1.2 The assignment of subjects to treatment groups is randomised.</td>
<td>Yes ☑ No ☐ Can't say ☐</td>
</tr>
<tr>
<td>1.3 An adequate concealment method is used.</td>
<td>Yes ☑ No ☐ Can't say ☐</td>
</tr>
<tr>
<td>1.4 Subjects and investigators are kept 'blind' about treatment allocation.</td>
<td>Yes ☐ No ☑ Can't say ☐</td>
</tr>
<tr>
<td>1.5 The treatment and control groups are similar at the start of the trial.</td>
<td>Yes ☑ No ☐ Can't say ☐</td>
</tr>
<tr>
<td>1.6 The only difference between groups is the treatment under investigation.</td>
<td>Yes ☑ No ☐ Can't say ☐</td>
</tr>
<tr>
<td>1.7 All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes ☑ No ☐ Can't say ☐</td>
</tr>
<tr>
<td>1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>Did not mention the drop out rate in the study</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
</tr>
</tbody>
</table>

## SECTION 2: OVERALL ASSESSMENT OF THE STUDY

### 2.1 How well was the study done to minimize bias? Code as follows: xi

- High quality (++) ☐
- Acceptable (+) ☐
- Unacceptable – reject 0 ☒

### 2.2 Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?

- Average attendance rate was 66% at exercise session.
- The total sample of 20 in the follow-up study provides 80% power and 5% significance.
- There is significant main effect for time, but the interaction of time and group was not significant. This indicates that psychological well-being improved over time. Therefore the results maybe overestimated.

### 2.3 Are the results of this study directly applicable to the patient group targeted by this guideline?

Yes

### 2.4 Notes. Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.

1. About 50% of the sample was taking medication at baseline and some were receiving counseling.
2. The effect of time would overestimate the result.
3. The drop out rate did not mention in the study.
Study identification  
(Archive author, title, year of publication, journal title, pages)

Guideline topic: Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.

**Before** completing this checklist, consider:

3. Is the paper a **randomised controlled trial** or a **controlled clinical trial**? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a **controlled clinical trial** questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

4. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

Reason for rejection: 1. Paper not relevant to key question  □  2. Other reason □  (please specify):

**Section 1: Internal validity**

*In a well conducted RCT study…*  

<table>
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<tr>
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<th>Does this study do it?</th>
</tr>
</thead>
</table>
| 1.1 | The study addresses an appropriate and clearly focused question.  
Yes □  Can’t say □  No □ |
| 1.2 | The assignment of subjects to treatment groups is randomised.  
Yes □  Can’t say □  No □ |
| 1.3 | An adequate concealment method is used.  
Yes □  Can’t say □  No □ |
| 1.4 | Subjects and investigators are kept 'blind' about treatment allocation.  
Yes □  Can’t say □  No □ |
| 1.5 | The treatment and control groups are similar at the start of the trial.  
Yes □  Can’t say □  No □ |
| 1.6 | The only difference between groups is the treatment under investigation.  
Yes □  Can’t say □  No □ |
| 1.7 | All relevant outcomes are measured in a standard, valid and reliable way.  
Yes □  Can’t say □  No □ |
| 1.8 | What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?  
20.8% |
| 1.9 | All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).  
Yes □  Can’t say □  No □ |

---

Footnotes:  
XII The study addresses an appropriate and clearly focused question.  
XIII The assignment of subjects to treatment groups is randomised.  
XIV An adequate concealment method is used.  
XV Subjects and investigators are kept 'blind' about treatment allocation.  
XVI The treatment and control groups are similar at the start of the trial.  
XVII The only difference between groups is the treatment under investigation.  
XVIII All relevant outcomes are measured in a standard, valid and reliable way.  
XIX What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?  
XX All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).
1.10 Where the study is carried out at more than one site, results are comparable for all sites. Yes □ No □ Can’t say □ Does not apply √

### SECTION 2: OVERALL ASSESSMENT OF THE STUDY

#### 2.1 How well was the study done to minimise bias?
**Code as follows:**
- High quality (++)
- Acceptable (+)
- Unacceptable – reject

#### 2.2 Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?
Overall adherence rate was 75% for the exercise group and 73% for the social support group. Overall adherence rate was 75% for the exercise group and 73% for the social support group. The total sample of 19 in the follow-up study provides power of 0.99 at α =0.05, d=0.8 (large effect size). 50-60% of sample receiving counselling or taking medication.

#### 2.3 Are the results of this study directly applicable to the patient group targeted by this guideline?
Yes

#### 2.4 Notes.
Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.
A direct association between improvements in fitness was related to improvement in depression for the pram-walking group. However, it is suggested that other factors e.g. counseling in combination with improvements in fitness influenced improvements in depression levels.
Methodology Checklist 3: Controlled Trials

Study identification  
(Include author, title, year of publication, journal title, pages)

Guideline topic: Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.

Before completing this checklist, consider:

5. Is the paper a randomised controlled trial or a controlled clinical trial? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a controlled clinical trial questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

6. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

Reason for rejection: 1. Paper not relevant to key question 2. Other reason (please specify):

Section 1: Internal validity

<table>
<thead>
<tr>
<th>Key Question No.</th>
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<tbody>
<tr>
<td>Guideline topic: Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.</td>
<td>Key Question No:</td>
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</table>

### Section 1: Internal validity

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<th>In a well conducted RCT study...</th>
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</thead>
<tbody>
<tr>
<td>1.1 The study addresses an appropriate and clearly focused question.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td>1.2 The assignment of subjects to treatment groups is randomised.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td>1.3 An adequate concealment method is used.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td>1.4 Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td>1.5 The treatment and control groups are similar at the start of the trial.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td>1.6 The only difference between groups is the treatment under investigation.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td>1.7 All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td>1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>7%</td>
</tr>
<tr>
<td>1.9 All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes ☑  No ☐</td>
</tr>
</tbody>
</table>

Does not apply ☐
| 1.10 | Where the study is carried out at more than one site, results are comparable for all sites. | Yes ☐ | No ☐ |
|      | Can’t say ☐ | Does not apply ☑ |

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

| 2.1 | **How well was the study done to minimise bias?**
Code as follows: High quality (++)
Acceptable (+)☐
Unacceptable – reject 0 ☐ |
|      | | |

| 2.2 | Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?
Most women reported an increase in physical activity level (n=27/33).
No information reported on the number of women taking medication or receiving psychological therapies. |
|      | | |

| 2.3 | Are the results of this study directly applicable to the patient group targeted by this guideline? | Yes |
|      | | |

| 2.4 | **Notes.** Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above. |
|      | | |

1. Women who received the exercise support program appeared to be benefited to their psychological wellbeing. Therefore they less likely to have high depression scores after childbirth
2. Inadequate demographic data between groups are provided.
Methodology Checklist 4: Controlled Trials

Study identification  (Include author, title, year of publication, journal title, pages)

Guideline topic: Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.

<table>
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<tbody>
<tr>
<td>Before completing this checklist, consider:</td>
<td></td>
</tr>
<tr>
<td>7. Is the paper a <strong>randomised controlled trial</strong> or a <strong>controlled clinical trial</strong>? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a <strong>controlled clinical trial</strong> questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+</td>
<td></td>
</tr>
<tr>
<td>8. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.</td>
<td></td>
</tr>
<tr>
<td>Reason for rejection: 1. Paper not relevant to key question □ 2. Other reason □ (please specify):</td>
<td></td>
</tr>
</tbody>
</table>

### Section 1: Internal validity

<table>
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<tr>
<th>Does this study do it?</th>
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</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Can't say</td>
</tr>
</tbody>
</table>

#### In a well conducted RCT study…

1.1 The study addresses an appropriate and clearly focused question.

1.2 The assignment of subjects to treatment groups is randomised.

1.3 An adequate concealment method is used.

1.4 Subjects and investigators are kept ‘blind’ about treatment allocation.

1.5 The treatment and control groups are similar at the start of the trial.

1.6 The only difference between groups is the treatment under investigation.

1.7 All relevant outcomes are measured in a standard, valid and reliable way.

1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?

| Yes | No |
| Can't say | |

18.4%
| 1.9 | All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).<sup>xlii</sup> | Yes □ | No □ | Can’t say □ | Does not apply □ |
| 1.10 | Where the study is carried out at more than one site, results are comparable for all sites.<sup>xliii</sup> | Yes □ | No □ | Can’t say □ | Does not apply □ |

### SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1 *How well was the study done to minimise bias?*

<table>
<thead>
<tr>
<th>Code as follows:&lt;sup&gt;xliv&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td>High quality (++) □</td>
</tr>
<tr>
<td>Acceptable (+) □</td>
</tr>
<tr>
<td>Unacceptable – reject 0 □</td>
</tr>
</tbody>
</table>

2.2 Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?

Most women were taking medication in the study.

2.3 Are the results of this study directly applicable to the patient group targeted by this guideline? Yes

2.4 **Notes.** Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.

1. Method of randomization, concealment and blinding used did not mention in the study.
### Methodology Checklist 5: Controlled Trials

**Study identification**  
(*Include author, title, year of publication, journal title, pages*)


**Guideline topic:** Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.

<table>
<thead>
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</thead>
</table>

**Before** completing this checklist, consider:

9. Is the paper a *randomised controlled trial* or a *controlled clinical trial*? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a *controlled clinical trial* questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

10. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

**Reason for rejection:** 1. Paper not relevant to key question □ 2. Other reason □ (please specify):

### Section 1: Internal validity

**In a well conducted RCT study...**

<table>
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<tbody>
<tr>
<td>Yes □ □ No □</td>
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<tr>
<td>Can't say □</td>
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<tbody>
<tr>
<td>1.1</td>
<td>The study addresses an appropriate and clearly focused question. xlvi</td>
</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
</tr>
<tr>
<td>1.2</td>
<td>The assignment of subjects to treatment groups is randomised. xlvii</td>
</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
</tr>
<tr>
<td>1.3</td>
<td>An adequate concealment method is used. xlviii</td>
</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
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<tr>
<td></td>
<td>Can't say □</td>
</tr>
<tr>
<td>1.4</td>
<td>Subjects and investigators are kept 'blind' about treatment allocation. xlix</td>
</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
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<tr>
<td></td>
<td>Can't say □</td>
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<td>1.5</td>
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</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation. lx</td>
</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
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<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way. li</td>
</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
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<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed? lii</td>
</tr>
<tr>
<td></td>
<td>Yes □ □ No □</td>
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<tr>
<td></td>
<td>Can't say □</td>
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<td>Can't say □</td>
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<tr>
<td></td>
<td>Does not apply □</td>
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</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

| 2.1 | *How well was the study done to minimise bias?* Code as follows: lv

| | High quality (++) ☑ |
| | Acceptable (+) ☐ |
| | Unacceptable – reject 0 ☐ |

| 2.2 | Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention? | The intervention effect was tested at two-tailed 0.05 significance level. A total sample size of 88 subjects was estimated to obtain 80% statistical power. |

| 2.3 | Are the results of this study directly applicable to the patient group targeted by this guideline? | Yes |

| 2.4 | **Notes.** Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above. | Home-based exercise is a feasible nonpharmacological intervention to alleviate postpartum depressive symptoms, especially in women with higher initial depressed mood scores as measured by the EPDS. |
Methodology Checklist 6: Controlled Trials

Study identification  (*Include author, title, year of publication, journal title, pages*)


Guideline topic: Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.

<table>
<thead>
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</table>

Before completing this checklist, consider:

11. Is the paper a **randomised controlled trial** or a **controlled clinical trial**? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a **controlled clinical trial** questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

12. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

Reason for rejection: 1. Paper not relevant to key question □ 2. Other reason □ (please specify):

### Section 1: Internal validity

*In a well conducted RCT study…*

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Yes □ No □ Can't say □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.1 The study addresses an appropriate and clearly focused question.</th>
<th>Yes □ No □ Can't say □</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 The assignment of subjects to treatment groups is randomised.</td>
<td>Yes □ No □ Can't say □</td>
</tr>
<tr>
<td>1.3 An adequate concealment method is used.</td>
<td>Yes □ No □ Can't say □</td>
</tr>
<tr>
<td>1.4 Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
<td>Yes □ No □ Can't say □</td>
</tr>
<tr>
<td>1.5 The treatment and control groups are similar at the start of the trial.</td>
<td>Yes □ No □ Can't say □</td>
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<tr>
<td>1.6 The only difference between groups is the treatment under investigation.</td>
<td>Yes □ No □ Can't say □</td>
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<tr>
<td>1.7 All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes □ No □ Can't say □</td>
</tr>
<tr>
<td>1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>3.7%</td>
</tr>
<tr>
<td>1.9 All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes □ No □ Can't say □</td>
</tr>
</tbody>
</table>

66
<table>
<thead>
<tr>
<th>Section</th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Can't say</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
</tbody>
</table>

### SECTION 2: OVERALL ASSESSMENT OF THE STUDY

<table>
<thead>
<tr>
<th>2.1</th>
<th>How well was the study done to minimise bias? Code as follows:</th>
<th>High quality (++)</th>
<th>Acceptable (+)</th>
<th>Unacceptable – reject 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How well was the study done to minimise bias? Code as follows:</td>
<td>High quality (++)</td>
<td>Acceptable (+)</td>
<td>Unacceptable – reject 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?</td>
<td>The total sample of 134 participants in the study provides power of 80% at $\alpha = 0.05$. Significant result yielded.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>Notes. Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.</td>
<td>22% of intervention group and 16% of control group are EPDS $\geq 13$.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Methodology Checklist 7: Controlled Trials

**Study identification**  
*(Include author, title, year of publication, journal title, pages)*


**Guideline topic:** Effectiveness of physical activities in reducing depressive symptoms of postnatal depressed women.

**Key Question No:**  
**Reviewer:**

**Before** completing this checklist, consider:

13. Is the paper a **randomised controlled trial** or a **controlled clinical trial**? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a **controlled clinical trial** questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+.

14. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

**Reason for rejection:** 1. Paper not relevant to key question 2. Other reason (please specify):

### Section 1: Internal validity

**In a well conducted RCT study…**

<table>
<thead>
<tr>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☑</td>
</tr>
</tbody>
</table>

| 1.1 | The study addresses an appropriate and clearly focused question. | Yes ☑ | No ☐ | Can’t say ☐ |
| 1.2 | The assignment of subjects to treatment groups is randomised. | Yes ☐ | No ☑ | Can’t say ☐ |
| 1.3 | An adequate concealment method is used. | Yes ☐ | No ☑ | Can’t say ☐ |
| 1.4 | Subjects and investigators are kept ‘blind’ about treatment allocation. | Yes ☐ | No ☑ | Can’t say ☐ |
| 1.5 | The treatment and control groups are similar at the start of the trial. | Yes ☐ | No ☑ | Can’t say ☐ |
| 1.6 | The only difference between groups is the treatment under investigation. | Yes ☐ | No ☑ | Can’t say ☐ |
| 1.7 | All relevant outcomes are measured in a standard, valid and reliable way. | Yes ☑ | No ☐ | Can’t say ☐ |
| 1.8 | What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed? | 17.9% |
| 1.9 | All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis). | Yes ☑ | No ☐ | Can’t say ☐ | Does not apply ☐ |
Where the study is carried out at more than one site, results are comparable for all sites.\textsuperscript{loxxvi}

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

| 2.1 | How well was the study done to minimise bias? Code as follows: \textsuperscript{loxxvii} | High quality (++)\(\square\)  
Acceptable (+)\(\square\)  
Unacceptable – reject 0 \(\square\) |
<p>| 2.2 | Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention? | The statistical power of the depression score between pre- and post-test was 0.34. Quasi-experimental design without control group would cause potential bias. |
| 2.3 | Are the results of this study directly applicable to the patient group targeted by this guideline? | Yes |
| 2.4 | Notes. Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above. | The three-month exercise intervention significantly reduced the depression level of the high score group (EPDS (\geq)15) |</p>
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Outcome measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armstrong &amp; Edwards (2003)</td>
<td>EPDS 6, 12 wk from baseline (immediately post-intervention)</td>
</tr>
<tr>
<td>Armstrong &amp; Edwards (2004)</td>
<td>EPDS 6, 12 (immediately post-intervention) and 24 wk from baseline</td>
</tr>
<tr>
<td>Heh et al. (2008)</td>
<td>EPDS 6, 20 wk postpartum (within 1 month post-intervention)</td>
</tr>
<tr>
<td>Daley et al. (2008)</td>
<td>EPDS 6, 12 wk from baseline (immediately post-intervention)</td>
</tr>
<tr>
<td>Da Costa et al. (2009)</td>
<td>EPDS 6, 12 from baseline (immediately post-intervention) and 24 wk from baseline</td>
</tr>
<tr>
<td>Norman et al. (2010)</td>
<td>EPDS 6, 8 (immediately post-intervention) and 12 wk from baseline</td>
</tr>
<tr>
<td>Ko et al. (2013)</td>
<td>EPDS 6 wk, 12 from baseline (immediately post-intervention)</td>
</tr>
</tbody>
</table>
## Appendix E
### Internal Validity of Selected Studies

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearly focused question</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Randomization</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>---</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Adequate concealment method used</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>---</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Blinding</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>---</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Similar treatment and control group</td>
<td>✓</td>
<td>✓</td>
<td>---</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Only difference is treatment under investigation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Relevant and reliable outcome measure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Drop out rate</td>
<td>Did not mention</td>
<td>20.8%</td>
<td>7%</td>
<td>18.4%</td>
<td>14.8%</td>
<td>3.7%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Intention-to-treat analysis</td>
<td>---</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>---</td>
</tr>
<tr>
<td>Grade of recommendation</td>
<td>1++</td>
<td>1+</td>
<td>2++</td>
<td>1+</td>
<td>1++</td>
<td>1++</td>
<td>2+</td>
</tr>
</tbody>
</table>
## Appendix E
Levels of Evidence

<table>
<thead>
<tr>
<th>Levels of Evidence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1++</td>
<td>High quality meta-analysis, systematic reviews of RCTs, or RCTs with a very low risk of bias</td>
</tr>
<tr>
<td>1+</td>
<td>Well conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias</td>
</tr>
<tr>
<td>1-</td>
<td>Meta-analyses, systematic reviews, or RCTs with a high risk of bias</td>
</tr>
<tr>
<td>2++</td>
<td>High quality systematic reviews of case control or cohort studies</td>
</tr>
<tr>
<td></td>
<td>High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal</td>
</tr>
<tr>
<td>2+</td>
<td>Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal</td>
</tr>
<tr>
<td>2-</td>
<td>Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal</td>
</tr>
<tr>
<td>3</td>
<td>Non-analytic studies, eg case reports, case series</td>
</tr>
<tr>
<td>4</td>
<td>Expert opinion</td>
</tr>
</tbody>
</table>
### Evaluation Questionnaire for Staffs

**Physical Activities in Reducing Depressive Symptoms for Postpartum Women**

Please circle the most appropriate number in the Likert scale:
(1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree)

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> The training sessions provided are useful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>2.</strong> The training sessions provided are easy to understand</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>3.</strong> I have increased knowledge about postpartum activities after the training sessions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>4.</strong> The teaching manual is clear and easy to use.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>5.</strong> There is adequate time to cover the content in two sessions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>6.</strong> There is adequate clerical support and resources from the department in conducting the intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>7.</strong> I have acquired adequate skills to conduct the program.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>8.</strong> Adequate help was offered during the training sessions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>9.</strong> I have increased job satisfaction from participating in this program.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>10.</strong> I have increased work stress from participating in this program.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>11.</strong> Overall, this program is worth conducting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

12. The strength of this programme is:

____________________________________________________________________________________

13. The weakness of this programme is:

____________________________________________________________________________________

14. Any suggestions to improve this programme:

____________________________________________________________________________________
Appendix G
Evaluation Questionnaire for Participants
Physical Activities in Reducing Depressive Symptoms of Postnatal Depressed Women

Evaluation Questionnaire for Participants
Please circle the most appropriate number in the Likert scale:
(1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree)

1. The program has successfully met its objectives. 1 2 3 4 5
2. Time schedule of the sessions is convenient to me. 1 2 3 4 5
3. Content of the program is easy to understand. 1 2 3 4 5
4. The physical activities learnt can be practice at home. 1 2 3 4 5
5. The nurse offered adequate guidance during the program. 1 2 3 4 5
6. The nurse provided adequate support during the telephone follow up. 1 2 3 4 5
7. I have acquired new skills for relaxation. 1 2 3 4 5
8. I have adequate time to complete the exercise log. 1 2 3 4 5
9. The mailed leaflets are useful in sustaining regular exercise. 1 2 3 4 5
10. Overall, the program was useful and worth joining. 1 2 3 4 5

11. The strength of this programme is:

                                                                                           
                                                                                           
12. The weakness of this programme is:

                                                                                           
                                                                                           
13. Any suggestions to improve this programme:

                                                                                           
                                                                                           

Please put a “√” in the most appropriate box:

1. Age:
   □ 18-25  □ 26-30  □ 31-35  □ > 35

2. Parity
   □ 1  □ 2  □ 3  □ > 3

3. Gestational age of your baby at birth:
   _______________ weeks

4. Educational level:
   □ None  □ Primary (P. 1-6)  □ Secondary (F. 1-7)
   □ Tertiary (University or above)
## Appendix H

**Costs and Benefits of Implementation**

### Estimated material costs

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written information</td>
<td>Leaflets and posters</td>
<td>$500</td>
</tr>
<tr>
<td></td>
<td>Teach manual</td>
<td>$100 each nursing staff X 500 = $5000</td>
</tr>
<tr>
<td>Salary*</td>
<td>Consultation</td>
<td>$374</td>
</tr>
<tr>
<td></td>
<td>Telephone follow up</td>
<td>$124</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$5998</strong></td>
</tr>
</tbody>
</table>

*Average salary point of nurse in Department of Health: $33000
Hourly salary = $33000/44 hours X 4 weeks = $187/hour
Consultation = $187 X 2 = $374
Telephone follow up = $187 X (20/60 Minutes) X 2 = $124

### Saved costs

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication for depression</td>
<td>$1 X 365</td>
<td>$365</td>
</tr>
<tr>
<td>Salary*</td>
<td>Consultation</td>
<td>$1700</td>
</tr>
<tr>
<td>Day hospital</td>
<td>$880/attendance X 12</td>
<td>$10560</td>
</tr>
<tr>
<td>Community nursing</td>
<td>$287 / visit X 12</td>
<td>$3444</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$16069</strong></td>
</tr>
</tbody>
</table>

*Average salary point of physician in Department of Health: $60000
Hourly salary = $60000/44 hours X 4 weeks = $340/hour
Consultation = $340 X 5 = $1700 (each time during child health visit)

**Cost-benefit ratio**
Benefit/ cost = $16069/ $5998 = 2.6
Appendix I
Recommendations

Target Audience

1. Women aged above 18 who attended Maternal and Child Health Centre (MCHC) with an Edinburgh Postnatal Depression Scale (EPDS) score of greater that 10 or diagnosed with mild or severe depression by physician at 6-48 weeks after delivery. [Grade A] 1++

Available Evidence:

- All eligible women aged 18 or above will be recruited. As teenage pregnancy usually associated with multi-psychosocial problem (Hoffman & Maynard, 2008), an age limit is set at 18 years in order to exclude women with teenage pregnancies.

- Postpartum women had either screened by the EPDS (≥ 10) as suggested by AAP (2010) are considered to have PND, that referral of treatment should be initiated with this cutoff point. PND is a non-psychotic depressive episode and it usually occurs 6 weeks to 48 weeks postpartum (Chan & Levy, 2004; Lee & Chung, 2005).

Venue

2. Home-based exercise programme

Venue is set in the health education room in MCHC for individual consultation. However, participants are mainly exercising at home setting.

Different types of exercise intervention have been used in previous studies including individualized home based exercise; community based group exercise and supervised exercise class in hospital. Home-based exercise programme is more feasible and viable. (Daley, MacArthur, & Winter, 2007; Dritsa et al., 2009; Da Coasta et al., 2009) [Grade A] 1+
Available Evidence:

- For women with postnatal depression, factors such as childcare, fatigue and travel time may reduce their opportunities and enthusiasm for exercise (Daley, MacArthur, & Winter, 2007).
- Home-based exercise is more feasible to alleviate postpartum depressive symptoms (Dritsa et al., 2009).
- Home-based exercise programme is effective in alleviating postpartum depressed mood (Da Costa et al., 2009).

Duration

3. 12 weeks intervention programme

12 weeks has been selected as the intervention duration as proven to have significant result in six trials studied. (Armstrong & Edwards, 2003; Armstrong & Edwards, 2004; Heh, 2008; Daley et al., 2008; Da Costa et al., 2009; Ko et al., 2013) [Grade A] 1++

Available Evidence:

- Six studies (Armstrong & Edwards, 2003; Armstrong & Edwards, 2004; Heh, 2008; Daley et al., 2008; Da Costa et al., 2009; Ko et al., 2013) yielded significant results of their 12-weeks programme.
- 12-week home-based exercise programme is more effective than usual care for reducing depressive symptomology in the postpartum period (Da Costa et al., 2009).

Type of consultations

4. Two one-to-one nurse lead consultation (week 1 and 4)

Women with postnatal depression, factors such as childcare, fatigue and travel time may reduce their opportunities and enthusiasm for exercise (Daley,
MacArthur, & Winter, 2007). Therefore the personalized consultations only last for 40-60 minutes. Most importantly they are held during the child immunization visits in MCHC, it could help in reducing the travel time of attending the consultations. The consultation centered on equipping women with the skills, knowledge and confidence needed to participate in regular exercise that can be practiced at home. A set of moderate intensity exercise was demonstrated such as pram-pushing. Participants are motivated and developed an exercise goal. Followed by second consultation (week 4) centered on encouraging their exercise adherence. (Hillsdon, Thorogood, & Foster, 2005; Daley et al., 2008) [Grade A] 1+

Available Evidence:

- Professional guidance and self-directed exercise would lead to a more significant effect in physical intervention (Hillsdon, Thorogood, & Foster, 2005).

- Personalized consultations have significant effect in higher the self-efficacy in performing exercise (Daley et al., 2008).

5. Telephone follow-up (15-20 minutes) (week 8 and 12) and leaflets (Appendix H) monthly mailed throughout the intervention period.

15-20 minutes follow-up telephone calls are made. Leaflets mailed to participant at each month. Both aimed at encouraging active participation in physical exercise. (Hillsdon, Thorogood, & Foster, 2005; Car & Sheikh, 2013) [Grade A] 1++

Available Evidence:

- Greater consistency of effect when there were four or more contacts, including face to face and phone contacts, between the one delivering the treatment and
the participants (Hillsdon, Thorogood, & Foster, 2005).

- The content of the consultation and telephone calls should include information, support and help in problematic situations to ensure the quality of the programme (Car & Sheikh, 2013).

Type of exercise

6. Moderate intensity pram-pushing exercise (Home exercise 30 minutes each time)

Two individualized exercise consultations in MCHC (40-60 minutes) (week 1, 4)

- First consultation (week 1): Demonstration of pram-pushing exercise lead by nurse. The exercise programme is aided with a video show.

| Stretching (FHS, 2008) | - Pelvic Tilting
- Back and abdominal exercise
5 minutes |
|------------------------|--------------------------------------------------|
- Lie with the head on the pillow, knees bent and shoulder length apart. This exercise works the muscles across the lower stomach which supports back and pelvis.
- Hollow the abdomen and flatten the back into the bed as the pelvis tilts.
- Breathe normally.
- Hole the position for 3-4 seconds and release gently.

- Back and abdominal exercise
- Lie on the back. Bend the knees and keep them together.
- Tighten the abdomen and flatten the low back against the bed.
- Bring both knees to right side so as to let the right knee touch the bed as far as possible.
- Return to the starting position and rest.
- Repeat but turn to the left.

| Warm-up
5 minutes | Doing alternate jogs and walks around the pram |
|-------------|---------------------------------------------|
**Pram-pushing** (Bowers, 2013)  
25 minutes

- **Lunges**
  - Stand behind the stroller with both hands on the handlebar shoulder-width apart.
  - Lunge forward with one leg, pushing the stroller out in front.
  - Knee should be directly above the ankle and the thigh parallel to the ground.
  - Return to the standing position and lunge with the other leg.

- **Squats**
  - Stand behind the stroller with both hands on the handlebar shoulder-width apart.
  - With feet and knees forward, squat down as if sitting on a chair, keeping the weight in heels and knees directly above the ankles. (Be careful not to put weight on the stroller; try not to tip the stroller.)
  - Squeeze the rear end and return to the starting position.

- **Side Bends**
  - Stand sideways behind the stroller, holding the handle in your left hand. Feet are shoulder-width apart. Bending to the left from your waist, reach your right arm overhead and stretch toward your child while pushing the stroller away with your left arm. Pull the stroller back toward you to straighten and return to the start position. Switch sides. Finally, cool down with light stretching.

**Debriefing**  
10 minutes

Motivate the participant with positive reinforcement to practice exercise 30 minutes for 3-5 times per week. Feedback will also be given after exercise. These could help in program adherence as suggested by Nicoloff & Schwenk (1995).

- Second consultation (week 4): Maintain adherence
  - Practice the pram-pushing exercises same as the first consultation.
Document the exercise log (Appendix J) of the participant in the past four weeks.

Promote regular exercise with leaflet given (Appendix L).

During the consultations held in MCHC, pram-pushing exercise would be demonstrated by nurse. The goal is to encourage participants to accumulate 30 minutes of moderate intensity exercise 3-5 days per week at home. (ACSM, 2006, Armstrong & Edwards, 2003; 2004; Hillsdon, Thorogood, & Foster, 2005; FHS, 2008; Bowers, 2013) [Grade A] 1+

Available Evidence:

Performing moderate intensity exercise 3-5 times per week for 20-60 minutes could help in maintaining physical well-being (ACSM, 2006).

Stretching including pelvic tilting and back and abdominal exercise are adopted by family health service in Hong Kong for postnatal exercise (FHS, 2008).

Pram-pushing exercise (60-75% age-predicted HR) is classified as moderate exercise level. Also it is an effective exercise intervention in reducing symptoms of postnatal depression (Armstrong & Edward, 2003; 2004; Bowers, 2013).

Debriefing: Motivation by healthcare provider is effective in active participation in physical exercise (Hillsdon, Thorogood, & Foster, 2005).

Evaluation

7. EPDS for evaluation (week 6 and 12)

In order to determine the level of improvement in depressive symptoms, participant will be asked to repeat the EPDS at week 6 and 12 (immediately post-intervention). Scores of EPDS before and after the intervention will be compared for evaluation of the effectiveness of the intervention in reducing the
symptoms of postnatal depression. (Collingwood, 2010; Bunevicius, Kusminskas, Bunevicius, 2009) [Grade A] 1++

Available Evidence:

- EPDS (Appendix K) is used as the instrument to assess postnatal mood changes (Collingwood, 2010).
- EPDS is a reliable screening tool that used for evaluation as its internal consistency was at a level of 0.83. The sensitivity and specificity of this screening tool of postpartum depression is 92% and 73% respectively (Bunevicius, Kusminskas, Bunevicius, 2009).
- The EPDS was translated into Chinese by a team of Hong Kong psychiatrists and has been validated. The sensitivity and specificity is 82% and 86% respectively (Lee et al., 1998; Li et al., 2011).

8. In order to achieve a high standard of practice, evaluation should be made at the end of the programme.

Nurses who conduct the intervention will also be invited to complete an evaluation questionnaire to gather comments and suggestions for improvement (Appendix F). Staff meeting with Senior Nursing Officers at the end of the programme for evaluating the manpower is needed to sustain the programme. Also participants will be asked to fill in an evaluation questionnaire (Appendix G) in terms of service expectation and the satisfaction of the intervention at the end of the programme. (Patton, 1997) [Grade A] 1+

Available Evidence:

- Evaluation can help to make sure clients are progressing toward desired outcomes and received services that meet their needs (Patton, 1997).
Appendix J
Dairy Log

Please circle the appropriate answer.

<table>
<thead>
<tr>
<th>Week</th>
<th>Have you done pram-pushing exercise in this week?</th>
<th>How many times of pram-pushing exercise performed in this week?</th>
<th>How long of pram-pushing exercise performed each time?</th>
<th>Reason of not doing pram-pushing exercise in this week.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Yes/ No</td>
<td>1 / 2 / 3 or above</td>
<td>≤ 15 mins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15-30 mins</td>
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<td></td>
<td></td>
<td></td>
<td>≥ 30 mins</td>
<td></td>
</tr>
<tr>
<td>Week 2</td>
<td>Yes/ No</td>
<td>1 / 2 / 3 or above</td>
<td>≤ 15 mins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15-30 mins</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>≥ 30 mins</td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td>Yes/ No</td>
<td>1 / 2 / 3 or above</td>
<td>≤ 15 mins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15-30 mins</td>
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<td></td>
<td></td>
<td></td>
<td>≥ 30 mins</td>
<td></td>
</tr>
<tr>
<td>Week 4</td>
<td>Yes/ No</td>
<td>1 / 2 / 3 or above</td>
<td>≤ 15 mins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15-30 mins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>≥ 30 mins</td>
<td></td>
</tr>
</tbody>
</table>
Appendix K
EPDS (English version)
THE EDINBURGH POSTNATAL DEPRESSION SCALE
TRANSLATION – SOUTH AFRICA - ENGLISH

As you have recently had a baby, we would like to know how you are feeling now. Please underline the answer that comes closest to how you feel. Please choose an answer that comes closest to how you have felt in the past seven days, not just how you feel today.

For example, I have felt happy:
Yes, all the time
Yes, most of the time
No, not very much
No, not at all
This would mean: 'I have felt happy most of the time during the past week.' In the past seven days:

1. I have been able to see the funny side of things:
   As much as I always could
   Not quite so much now
   Definitely not so much now
   Not at all

2. I have looked forward with enjoyment to things:
   As much as I ever did
   A little less than I used to
   Much less than I used to
   Hardly at all

3. I have blamed myself unnecessarily when things went wrong:
   Yes, most of the time
   Yes, some of the time
   Not very much
   No, never

4. I have been worried for no good reason:
   No, not at all
   Hardly ever
   Yes, sometimes
   Yes, very much

5. I have felt scared or panicky for no very good reason:
   Yes, quite a lot
   Yes, sometimes
   No, not much
   No, not at all

6. Things have been getting on top of me:
   Yes, most of the time I haven’t been managing at all
   Yes, sometimes I haven’t been managing as well as usual
   No, most of the time I have managed quite well
   No, I have been managing as well as ever
7. I have been so unhappy that I have had difficulty sleeping (not because of the baby):
   Yes, most of the time
   Yes, sometimes
   Not very much
   No, not at all

8. I have felt sad and miserable:
   Yes, most of the time
   Yes, quite a lot
   Not very much
   No, not at all

9. I have been so unhappy that I have been crying:
   Yes, most of the time
   Yes, quite a lot
   Only sometimes
   No, never

10. The thought of harming myself has occurred to me:
    Yes, quite a lot
    Sometimes
    Hardly ever
    Never
愛丁堡產後憂鬱量表 (HK-EPDS2.0a)

說明：因為您剛生了孩子，我們想了解一下您的感受，請選擇一個最能反映您過去七天感受的答案。
注意：不只是您今天的感覺，而是過去七天的感受。例如：我感到愉快。

選擇答案（2）表明在上一周內你大部分時間都感到愉快。請照同樣方法完成以下各題。
在過去七天內：

1. 我能想到事物有趣的一面，並笑得開心。
   （1）同以前一樣。
   （2）沒有以前那麼多。
   （3）肯定比以前少
   （4）完全不能。

2. 我欣然期待未來的一切。
   （1）同以前一樣。
   （2）沒有以前那麼多。
   （3）肯定比以前少
   （4）完全不能。

3. 當事情出錯時，我會不必要地責備自己
   （1）大部分時候這樣。
   （2）有時候這樣。
   （3）不經常這樣。
   （4）一點也沒有。

4. 我無緣無故感到焦慮和擔心。
   （1）一點也沒有。
   （2）極少有。
   （3）有時候這樣。
   （4）經常這樣。

5. 我無緣無故感到害怕和驚慌。
   （1）相當多時候這樣。
   （2）有時候這樣。
   （3）不經常這樣。
   （4）一點也沒有。

6. 很多事情衝著我而來，使我透不過氣。
   （1）大多數時候我都不能應付。
   （2）有時候我不能像平時那樣應付得好。
   （3）大部分時候我都能像平時那樣應付得好。
   （4）我一直都能應付得好。
我很不開心，以至失眠。
(1) 大部分時候這樣。
(2) 有時候這樣。
(3) 不經常這樣。
(4) 一點也沒有。

我感到難過和悲傷。
(1) 大部分時候這樣。
(2) 相當時這樣。
(3) 不經常這樣。
(4) 一點也沒有。

我不開心得哭。
(1) 大部分時候這樣。
(2) 有時候這樣。
(3) 只是斷斷續續這樣。
(4) 沒有這樣。

我想過要傷害自己。
(1) 相當多時候這樣。
(2) 有時候這樣。
(3) 很少這樣。
(4) 沒有這樣。
Stretching (FHS, 2008)
- Pelvic Tilting
- Back and abdominal exercise
5 minutes


Pram-pushing (Bowers, 2013)
25 minutes

Have a nice day,
30 minutes exercise a day!

Stay Healthy, Be Active!
References


