An-Najah National University
Faculty of Graduate Studies

Prevalence of Postpartum Depression among Recently Delivering Mothers in Nablus District and Its Associated Factors

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Dedication

I dedicate this work to my great family, my parents and parents-in-law
To my dear wife Nidaa and my son Osama
And to my brothers, sisters and friends
For all the support and encouragement they gave to me

I also dedicate this thesis to the Palestinian Women who struggle to survive and to please their families despite the occupation efforts to destroy the meaning of life in this land

Khubaib

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الإقرار

أنا الموقع/ة أدناه، الرسالة التي تحمل العنوان:

Prevalence of Postpartum Depression among Recently Delivering Mothers in Nablus District and Its Associated Factors

أُقرُّ بأنَّ ما اشتملت عليه هذه الرسالة، إنّما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وإن هذه الرسالة كلّها ، أو أي جزء منها لم يقدم من قبل لنيل أية درجة، أو لقب علميّ، أو بحثيّ لدى أية مؤسسة تعليمية، أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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Date: **التاريخ: 2014/9/28**

List of abbreviations

APA:	American Psychiatric Association
BDI:	Beck Depression Inventory
BMI:	Body Mass Index
CI:	Confidence Interval
CPMD:	Common Perinatal Mental Disorders
CS:	Caesarean Section
DSM-IV-TR:	Diagnostic Statistical Manual, 4th edition, Text Revision
EPDS:	Edinburgh Postnatal Depression Scale
ICD-10:	International Classification of Diseases, 10th edition
IRB:	Institutional Review Board
MCHC:	Maternal and Child Health Clinic
MDE:	Major Depressive Episode
MINI:	Mini International Neuropsychiatric Interview
MOH:	Ministry of Health
MSSS:	Maternal Social Support Scale
NICU:	Neonatal Intensive Care Unit
OR:	Odds Ratio
PHC:	Primary Health Care
PP:	postpartum
PPD:	Postpartum Depression
PSE:	Present State Examination
SES:	Socio-economic Status
SPSS:	Statistical Package for Social Sciences
SRQ:	Self-Reported Questionnaire
UAE:	United Arab Emirates
UNRWA:	United Nations Relief and Work Agency for Palestinian Refugees
WHO:	World Health Organization

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Prevalence of Postpartum Depression among Recently Delivering Mothers in Nablus District and Its Associated Factors

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Abstract

Background:

Postpartum Depression (PPD) is a challenging condition and a major public health problem because of its great effect on the mother and her child in a critical period of child development. Nevertheless, it has received little attention in the Palestinian primary care and MCH clinics. The aim of this study was to determine the prevalence and associated factors of PPD among women aged 18-45 years in Nablus district.

Methods:

This is a cross-sectional study in which 246 conveniently chosen mothers aged 18-45 years from Nablus district were interviewed at 7-12 weeks after birth in 12 primary care and Maternal and Child Health (MCH) clinics of the Ministry of Health (MOH) and UNRWA, in May and June, 2013. Participants were interviewed using an Arabic version of Edinburgh Postnatal Depression Scale (EPDS; cut off $\geq$ 10) and other questions of PPD related risk factors. An-Najah University IRB approval and participants' informed consents were taken.

Results:

235 interviews were valid for analysis with mean age of 26.13 (SD ±5.3) years. 49.8% of mothers live in Nablus city whilst 29.8% and 20.4% live in villages and in refugee camps respectively. Forty mothers (17%) scored ≥ 10 and were considered depressed including 21 mothers (8.9%) scored ≥ 13 and considered to have severe depression.

Univariate analysis showed that depression during pregnancy *[OR: 20.5; (8.84-47.74); p <0.001]*; positive personal mental history *[OR: 15.7; (1.59-155); p 0.016]*; exposure to 2 or more stressful events during pregnancy *[OR: 7.8; (2.21-27.53); p <0.001]*; poor satisfaction with the marital relationship *[OR: 11.9; (3.39-41.97); p <0.001]*, husband's help and support *[OR: 6.3; (3.03-13.2); p <0.001]* and the mother-in-law relationship *[OR: 2.6; (1.03-6.57); p 0.037]*; and perceived low social support *[OR: 13.7; (3.50-53.96); p <0.001]* were strongly associated with PPD. No significant relationships were observed with socio-demographic characteristics (age, education, residence and income); pregnancy and birth factors or newborn factors.

Conclusion and recommendations:

Prevalence of PPD is high among Palestinian mothers and is mainly associated with psychosocial stressors during pregnancy. Although further research is needed in this area due to small sample size and non-random approach, we highly recommend the integration of PPD screening into the antenatal and postnatal healthcare services and to give more time to mothers counselling in addition to the medical services offered.

Chapter One
Introduction

1.1. BACKGROUND:

Postpartum depression (PPD) is one of the major underestimated public health problems in the maternal and mental health[1]. It affects 13% of mothers worldwide within the first year after birth representing a relatively high prevalence especially occurring in a critical time in the life of both the babies and their mothers[2]. The following sections will discuss the definition of postpartum depression, its etiology and risk factors.

1.1.1. Definition of postpartum depression:

According to The American Psychiatric Association (APA) postpartum or postnatal depression (PPD or PND) is defined as occurrence of a major depressive episode (MDE) within 4 weeks after delivery[3].

Major depressive episode is defined in APA Diagnostic Statistical Manual of Mental Disorders (DSM-V) as presence of at least five of the following symptoms most of the day, nearly every day for 2 week period with impairment or decline of the previous level of functioning. These symptoms are: Depressed mood, often accompanied with anxiety; Markedly diminished pleasure in activities; Loss of appetite and weight; sleep disturbances, often insomnia; Physical agitation or psychomotor slowing; Fatigue and low energy; Feeling worthlessness or inappropriate guilt; Decreased concentration and decision making ability; Recurrent suicidal ideation or thoughts of death. The presence of depressed mood or loss of interest is a must for diagnosis of MDE[3, 4].

1.1.2. PPD time of occurrence:

Although APA specifies PPD with the onset within 4 weeks postpartum, this time limit has been questionable with great debate and many authors considered the onset to occur any time during the first postpartum year, with incidence decreasing dramatically after 3 months of birth[5-7]. The World Health Organization (WHO) International Classification of Disease (ICD-10) specifies the postpartum onset within 6 weeks after birth[8].

Moreover, a large Danish cohort study followed up 630,373 first time mothers and 547,431 first time fathers for one year postpartum from 1973 to 2005, to estimate the risk of postpartum mental disorders in need of hospital admission or medical outpatient care. The study found that the risk of hospital admission or outpatient visit for mental disorder was higher during the first 3 months [9]. In addition, the risk of incidence of a major depressive episode was 2.79 from 0-30 days, 3.53 from 31-60 days and 2.08 from 3-5 months postpartum compared to the period 6-12 months postpartum[9].

These findings are in harmony with the recommendation of many experts of extending the onset time of PPD to 3 months rather than 4 weeks as in the APA, DSM IV[4, 5].

1.1.3. Other postpartum mood disturbances:

In addition to postpartum depression, two other postpartum mood disturbances should be considered in order not to be confused with it. These are postpartum blues and postpartum or puerperal psychosis.

Postpartum blues or “baby blues” are very common self-remitting mood disturbance, affecting 30-75% of mothers, starting 3-4 days after birth and resolve spontaneously within the 10th day. Symptoms include: sadness, anxiety, irritability, weeping and tearfulness, with sleep and appetite disturbances not affecting the functional ability of the mother[4, 10].

On the other extreme, puerperal psychosis affects 0.1 – 0.2 % of mothers, starting within 2 weeks after birth and is considered a psychiatric emergency requiring hospitalization[4, 10]. In addition to severe depression, this syndrome is characterized by severe psychotic features including: extreme thought and behavior disorganization, acute mood swings, and unusual hallucinations and delusions[4, 7, 10, 11]. It is proved that this syndrome is caused by biological and hereditary factors rather than psychosocial and demographic factors[4, 10]. Early diagnosis and treatment is essential to prevent affected mothers from harming themselves or their children.

1.1.4. Etiology of PPD:

The etiology of PPD like other mental illnesses is another area of debate. Although biological factors have been identified to cause PPD in genetically predisposed women, the importance in psychosocial factors in causing PPD cannot be ignored[4, 11].

The basis for biological theory is the rapid decline in reproductive hormones levels, mainly estrogen and progesterone, soon after birth. To prove this, Bloch et al. conducted a double-blind controlled trial mimicking hormonal changes during pregnancy and after childbirth in 16 non-

depressed women (8 with history of PPD)[12]. The 16 women were given leuprolide to induce a hypogonadal state followed by high doses of estrogen and progesterone to achieve pregnancy like levels and then followed withdrawal of these medications to mimic changes occurring after childbirth. While none of the women without previous history of PPD developed mood changes, 5 out of 8 women with previous history of PPD developed a major depressive episode[12]. This result supports the theory that mothers with PPD are highly sensitive to withdrawal of gonadal hormones compared with those without PPD.

In spite of this biological relationship, stressful life events, personal and family history of depression, poor marital relationships and low social support still have causal associations and are strong predictors of PPD in almost most studies[4, 11].

1.1.5. Consequences of postpartum depression:

While PPD is similar to major depressive episodes occurring at any time during mother's life, the importance of PPD stems from the fact that it occurs during a sensitive period of life (the postpartum period), exerting a negative effect on mothers, their babies and families and the entire society.

PPD increase the risk of mother's social isolation in addition to the negative feelings of depression (worthlessness and helplessness). Fatigue and loss of energy may result from depression itself or from other consequences like loss of appetite and disturbed little sleep[13].

Logsdon et al. has defined four areas of mothering function that are negatively affected by PPD. PPD causes impairment of mother-infant

interaction as infants are exposed to either withdrawn (e.g. avoidance and decreased face-to-face contact) or intrusive (e.g. grimacing and shouting) mother's behavior. This results in less vocalization and facial expressions of the infant and even long term adverse effects on his cognitive and emotional development[14].

Other negatively affected areas are: caretaking of the infant (e.g. feeding, diaper change and safety monitoring); providing health care to infant manifested by decreased adherence to regular checkup well-baby visits and increased frequency healthcare providers visits due to infant problems; and lastly, depressed mothers have lower rates of gratification and enjoyment in their mothering role compared with non-depressed mothers[14].

PPD does not only affect children, but its effect on marital and family relationship can be deleterious, ranging from marital disagreements and hostility to marital separation and even divorce[13].

1.2. Statement of the problem

Depression is the leading cause of disease burden in women aged 15-44 years in both high-income and low- and middle-income countries[15]. The onset of depression during postpartum period is particularly important in this age group and is considered as a major public health problem affecting mothers, fathers, children and the whole family[13].

While the prevalence of PPD is 10-15% in Western countries,[7] this number reaches 19.8% (95% CI: 19.5% -20%) in low- and lower middle-income countries[16]. After searching internet databases like pubmed and Google scholars, the researcher has not found any published studies about

postpartum depression in Palestine. However, studies from culturally and socially similar Arab population like Jordan reveals high PPD prevalences of 22%[17] and 26.6%[18].

Taking into consideration the scarcity of data about postpartum depression and its associated factors in Palestine, this study may serve as a first step exploration study to bring this substantially important topic out of shadows and to guide further research and health policy interventions for early identification and management of PPD and its predisposing factors.

1.3. Significance of the study:

1) Significance to public health research:

   As this study is the first study about the prevalence and associated factors of PPD in the Palestinian society, it will serve as an exploratory study for further exploration of this important topic. Furthermore, it will expand our knowledge about the various aspects of postpartum depression among Palestinian women in order to focus on in coming researches.

2) Significance to public health and maternal mental health practice:

   This study is expected to unveil and draw the attention of the health care practitioners to many ignored aspects of postpartum depression and it associated factors, in order to give them more focus during the care of pregnant and postpartum women.

3) Significance to healthcare decision makers:

   The study is expected to urge healthcare decision makers to consider this important topic – the postpartum depression- in the planning and

delivering of healthcare services. It will work as a first step toward the integration of PPD screening into the routine antenatal and postnatal care services in Palestine.

1.4. Objectives:

The main objective is to determine the prevalence and associated factors of postpartum depression among mothers aged 18-45 years in Nablus district at 2 months after birth.

1.4.1.Specific objectives:

1) To determine the proportion of mothers aged 18-45 years in Nablus who have postpartum depression (scoring ≥ 10 on EPDS scale) at 2 months postpartum.
2) To determine the proportion of mothers aged 18-45 years in Nablus who have severe postpartum depression (scoring ≥ 13 on EPDS scale) at 2 months postpartum.
3) To determine the socio-demographic factors associated with PPD in women aged 18-45 years in Nablus district.
4) To determine pregnancy and birth related factors associated with PPD in women aged 18-45 years in Nablus district.
5) To determine newborn related factors associated with PPD in women aged 18-45 years in Nablus district.
6) To determine marital and family relationship factors associated with PPD in women aged 18-45 years in Nablus district.
7) To determine psychosocial factors associated with PPD in women aged 18-45 years in Nablus district.

1.5. Research questions:

The main aim of this study is to estimate the prevalence of postpartum depression in Nablus district and to figure out some of the factors associated with PPD. The following research questions were formed to generate hypothesis about relationship between different variables and postpartum depression. They are summarized in table 1.1.

Table 1.1: List of study research questions:

	List of study research questions
1	Is there a significant difference in ***socio-demographic factors (age, residence, level of education, occupation, average monthly income, insurance type)*** between depressed and non-depressed mothers
2	Is there a significant difference in ***pregnancy and birth related factors (obstetrical complications, place of delivery, type of delivery, episiotomy, pregnancy occurring desire, overall satisfaction with medical care during birth)*** between depressed and non-depressed mothers
3	Is there a significant difference in ***the rate of medical diseases*** between depressed and non-depressed mothers
4	Is there a significant difference in ***newborn factors (gender, newborn NICU need, newborn feeding method)*** between depressed and non-depressed mothers
5	Is there a significant difference in ***perception of marital life quality*** between depressed and non-depressed mothers
6	Is there a significant difference in ***perception of husband support and help*** between depressed and non-depressed mothers
7	Is there a significant difference in ***quality of relationship with mother-in-law*** between depressed and non-depressed mothers
8	Is there a significant difference in ***perceived social support*** between depressed and non-depressed mothers
9	Is there a significant difference in ***the presence of personal or family history of mental illness*** between depressed and non-depressed mothers
10	Is there a significant difference in ***antenatal depression rate*** between depressed and non-depressed mothers
11	Is there a significant difference in ***the experience of life stressful events*** between depressed and non-depressed mothers

Chapter Two
Literature Review

II. Focused literature review:

The published scientific literature about postpartum depression is rich and diverse, so the plan was to focus on studies discussing the prevalence and risk factors or associated factors of postpartum depression only. Exclusion was planned for articles discussing postpartum depression in fathers, prevalence among special groups (like HIV positive mothers, adolescents or immigrants), studies about antepartum depression only, prevention and treatment studies, studies about complications or effects of PPD, studies about the healthcare workers knowledge, attitude and practice toward PPD, and studies investigating the hormonal or biological causes of PPD (like folate or vitamin D deficiency).

A search of the pubmed database was done using the terms “postpartum depression” AND “prevalence” found 1,394 full text articles in the last 10 years (from January 2003 till March 2014). 1,114 articles were excluded by their title, and the abstracts of the remaining 280 articles were scanned. In order to be more concise, 6 systematic reviews about PPD prevalence and risk factors in both developed and developing countries were reviewed. In addition, an extensive systematic review of the peer-reviewed journal published Arab studies that was done earlier by the researcher and his supervisors was included.

2.1. PPD worldwide:

2.1.1. The systematic reviews about PPD prevalence worldwide:

Six peer-reviewed-journal published systematic reviews were identified from the period between 1996 and 2012. Systematic reviews concerned

with specific subgroups like rural women[19] and preterm birth and low birth weight[20] were excluded.

In 1996, O'Hara and Swain published the first systematic review and meta-analysis about prevalence and risk factors of PPD[2]. This extensive review and meta-analysis of 59 PPD studies with aggregate sample size of 12,810 women still used as a reference in many recent studies[16, 19]. The overall PPD prevalence was 13% (95% CI: 12.3%-13.4%)[2]. Importantly, self-report tools investigating PPD resulted in statistically significant higher prevalence than interviews (14% [95% CI: 13.1%-14.9%] vs. 12% [95% CI: 11.3%-12.7]) [2].

The advantages of this study are doing meta-analysis of prevalence and risk factors and providing an aggregate prevalence measure rather than listing unrelated prevalence rates. It also provided an estimate of the effect size shared by each risk factor. On the other hand, almost all of the studies included in this review are conducted in developed countries which may lead to biased estimation of PPD global prevalence.

In 2005, Gavin et. al. published a systematic review about prevalence and incidence of Perinatal depression from 1980 to 2004 in the developed countries only[21]. The review included the studies that used clinical assessment or interviews only and excluded those based on self-report measures[21]. Gavin et. al. did a meta-analysis of prevalence of depression during different trimesters of pregnancy and each postpartum month in the first postpartum year.

The highest point prevalence of depression was in the 3rd postpartum month (12.9% [95% CI: 10.6%-15.8%], whereas it ranged around 10.6% in the 2nd to 7th postpartum months and then decreased more[21]. Point prevalence of major depression peaked in the 2nd and 6th postpartum month to 5.7% [95% CI: 3.8%-8.7%] and 5.6% [95% CI: 2.4%-12.1%] respectively. The period prevalence of postpartum depression since birth till 3 months postpartum was 19.2% [95% CI: 10.7%-31.9%]. On the other hand, the incidence of new cases of PPD was 14.5% [95% CI: 10.9%-19.2%] during the first 3 postpartum months, with 6.5% incidence of major depression in the same period[21]. Overall, the study of Gavin et. al. was thorough and precise as it depends on clinical assessment of depression rather than self report tools, but partly limited as it did not included studies from developing countries and the reviewed studies used different diagnostic approaches.

A year later, Halbreich and Karkun did a review of 143 studies on PPD prevalence in 40 countries from 1980 to 2005[22]. It was a listing of the prevalence according to the country worldwide rather than a systematic synthesis and analysis of these studies. Moreover, they calculated the weighted mean prevalence in the first 6 months postpartum if there is more than one study in the same country. The authors reported a wide range of PPD prevalence from 0.5% to 60%[22]. The highest ten prevalences were in Guyana (57% at 4-6 weeks PP, EPDS $\geq$ 10; n=93); Brazil (42.8% at 4 weeks PP, EPDS $\geq$ 13, n = 21); Italy (mean prevalence by EPDS 38.1%); Chile (mean prevalence by EPDS 37.4%); South Africa (mean prevalence by EPDS 36.5%); South Korea (36.1% at 4-6 weeks PP by EPDS $\geq$ 10,

n=97); Taiwan (mean prevalence by EPDS ≥ 10 at 4-6 weeks was 34.5%); Vietnam (33% at 6 weeks by EPDS ≥ 12, n=506); India (mean prevalence by EPDS was 32.4%); and Turkey (mean prevalence by EPDS was 29.8%)[22].

The lowest ten prevalences were in Singapore (0.5% at 12 weeks by EPDS ≥ 16, n =200); Malta (3.9% by ICD-10 criteria, n=229); Malaysia (3.9% at 6 weeks by EPDS > 13, n=154); Austria (5% at 6 months by EPDS ≥ 13, n=20); Denmark 5.5% at 6 weeks by EPDS ≥ 13, n=5091); France (mean prevalence by EPDS 8.5%); Australia (mean prevalence by EPDS was 9%); Norway (mean prevalence by EPDS was 9.3%); Sweden (mean prevalence by EPDS was 12.3%); and Switzerland (10.2% at 3 months by EPDS ≥ 13, n= 570)[22].

The main cause of this wide difference in prevalence across countries is due to the differences in how the assessment tools are used including the tools itself, the cut off scores, the timing and setting of administration, and the sample size of the study. For example, The highest prevalence was in Guyana were a small sample of 93 mothers were investigated at 4-6 weeks postpartum and the cut off score of EPDS used to define PPD was ≥ 10, whereas the lowest prevalence is in Singapore, where mothers were investigated at 12 weeks and the cut off score of EPDS used to define PPD was ≥ 16. This seems plausible as PPD prevalence peaks in the first 3 postpartum months and the rate increase with decreasing EPDS cut off point. Another drawback is the calculation of weighted mean prevalence for the countries where more than one study are conducted. These

prevalences were calculated for the first 6 months for the same tool (mostly EPDS) despite the fact that different cut off scores and assessment times were used which may falsely over or underestimate the mean prevalence result. Halbreich and Karkun actually identified some of the causes for this variable prevalence including the difference in assessment tools, their cut offs and the time of assessment[22]. In addition, they thought that there is a response bias in self-report measures in some cultures as women may over or underestimate the response according to their beliefs, perceptions and social context. Other reasons like using mainly "Western" diagnostic approaches for PPD assessment, as depression may be perceived in a different way across cultures (e.g. some Asian cultures usually refer to somatic complaints to express depression rather than emotional complaints), and the translation of those Western tools may be incomplete or incomprehensive to women from other cultures[22]. In sum, this review has the advantage of including a large number of PPD studies in addition to developing countries studies and it tried to address cultural aspects of difference in PPD prevalence, but it lacked a systematic approach of building such evidence.

2.1.2. The systematic reviews about PPD risk factors worldwide:

As the assessment of the prevalence resulted in wide variations, the assessment of the risk factors has the same variation. A large number of the studies were cross-sectional studies where they can figure out factors associated with PPD without determining a causal relationship[2]. On the other hand there was prospective studies who followed mothers during

pregnancy and in the postpartum period to determine if the presence of such factors during pregnancy and after birth lead to PPD in a previously determined point after delivery.

Another important issue to discuss when talking about risk factors is the effect size, which tells to what degree the investigated factors is associated with the occurrence of PPD or in other words, the strength of the association between the so-called risk factors and PPD[2, 23]. Many ways are used in statistics to reflect the size if the effect including Cohen's *d* (δ) and the correlation coefficient (r). Cohen's *d* depends on the mean difference between two groups and indicates a weak relationship when equals 0.2, a moderate relationship when equals 0.4 and a strong relationship when equals 0.8 or more[23]. On the other hand, when r is 0.1, 0.3, 0.5, it indicated a small, moderate and large effect size respectively[23].

O'hara and Swain[2] conducted a meta-analysis of PPD risk factors and found that strong and moderate predictors of PPD were: mother's depression during pregnancy (*d= 0.75, 95% CI: 0.67-0.83; r=0.35*), mother's anxiety during pregnancy (*d=0.68, 95% CI: 0.55-0.81, r=0.32*), poor social support (*d= 0.63, 95% CI: 0.51-0.75; r=0.3*), stressful life events (*d=0.60, 95% CI: 0.54-0.67; r=0.29*), poor partner's support (*d= 0.53, 95% CI: 0.39-0.67; r=0.25*), presence of previous psychiatric history in the mother (*d= 0.57, 95% CI: 0.49-0.65; r=0.27*), negative cognitive attributional style (*d= 0.24, 95% CI: 018-0.31; r=0.12*) *[i.e: attributional style is the way how the person explain the cause of an event or attribute it to a cause. Negative attributional style is when one attribute the negative*

event to internal (blaming self), stable (persists or recurrent), and global (affects many situations) causes](24) and neuroticism (*d= 0.39, 95% CI: 0.21-0.57; r=0.19*) *[i.e: a personality trait characterized by anxiety, moodiness, worry, envy, and jealousy and people who has this trait tend to feel anxiety, anger, envy, guilt, and depressed mood more than other people]*[25].

Mild PPD predictors were pregnancy and delivery complications (*d= 0.26, 95% CI: 0.19-0.34; r= 0.13*), lower family income (*d= 0.14, 95% CI: 0.08-0.21*), mother's unemployment (*d=0.14, 95% CI: 0.04-0.25*) and poor marital relationship satisfaction (*d= 0.13, 95% CI: 0.06-0.20; r=0.07*). No significant association was observed with: mother's age, marital status, length of relationship with the partner, education, parity, number of children, marital status and family psychiatric history.

In 2001, Beck performed a systematic review and meta-analysis about the predictors of PPD in 84 studies published from 1990-1999[23]. These studies included unpublished dissertations and master thesis (36% of the total studies included) in addition to published journal articles and also included studies from developing countries. The author identified 13 factors as predictors of PPD. Prenatal depression (*95% CI of mean r= 0.44-0.46*), low self esteem (*95% CI of mean r= 0.45-0.47*), childcare stress (*95% CI of mean r= 0.45-0.46*), prenatal anxiety (*95% CI of mean r= 0.41-0.45*), life stress (*95% CI of mean r= 0.38-0.40*), low social support (*95% CI of mean r= 0.36-0.41*), marital relationship (*95% CI of mean r= 0.38-0.39*), history of previous depression (*95% CI of mean r= 0.38-0.39*), bad

infant temperament (*95% CI of mean r= 0.33-0.34*), maternity blues (*95% CI of mean r= 0.25-0.31*), single marital status (*95% CI of mean r= 0.21-0.35*), low socioeconomic status (*95% CI of mean r= 0.19-0.22*), and unplanned/unwanted pregnancy (*95% CI of mean r= 0.14-0.17*) were moderate and mild predictors of PPD[23].

Further review of PPD risk factors was done by two reputable research institutions: The National Health and Medical Research Council (NHMRC) of Australia[26] and University of Toronto Women's Health Program[6]. These institutions classified the risk factors of PPD into 3 categories according to power of evidence supporting their association with PPD. These categories are: 1) confirmed risk factors or strong predictors, with evidence from randomized controlled trials or approximately 75% of well-designed cohort studies; 2) probable risk factors or moderate predictors, with evidence from 40% to 60% of peer-reviewed published studies; and 3) possible risk factors or small predictors, which has very little evidence or equivocal findings at present[10, 26].

Confirmed risk factors of PPD were: depression or anxiety during pregnancy, a previous history of depression, stressful recent life events, marital problems and poor social support. Less powerful predictors or probable risk factors included: family history of mental illness especially depression, severe postpartum blues, bad infant temperament and health, stress over childcare issues, low self-esteem and neuroticism, birth experience and obstetric and pregnancy complications. Possible risk factors included: single mothers, low socioeconomic status and income, while

there was no significant relationships with race, mother's age, education, number of births (parity) or the baby's sex[10, 26].

2.1.3. The systematic reviews about PPD prevalence in developing countries:

In 2009, Klainin and Arthur published a review of all English-written studies about PPD risk factors conducted in the Asian countries from 1998-2008[27]. The review included 64 studies from 17 Asian countries (China, Hong Kong, India, Indonesia, Iran, Israel, Japan, Lebanon, Malaysia, Nepal, Pakistan, Singapore, Taiwan, Thailand, Turkey, United Arab Emirates and Vietnam). 68.8% of the studies used EPDS as a measure for depression[27]. Prevalence ranged widely from 3.5% to 63.3%[27] for similar reasons addressed by Halbreich and Karkun[22].

A year later, Sawyer et. al. published a systematic review of the studies investigating psychological wellbeing (depression, anxiety, post-traumatic stress disorder PTSD and general mental health) during pregnancy and the postpartum period in Africa from 1972 to 2009[28]. The review included 35 English-written studies that were conducted in Nigeria, South Africa, Uganda, Ethiopia, Morocco, Gambia, Zimbabwe and Malawi[28]. Of these, 21 studies with aggregate size of 10,093 mothers investigated postpartum depression yielding a wide range of PPD prevalence from 3.2% to 48%, and a mean weighted prevalence of 18.3% [95% CI: 17.6%-19.1%][28].

In 2012, Fisher et al. reviewed the prevalence and determinants of PPD in low- and lower-middle- income countries, including 34 studies (14 cohort and 20 cross-sectional studies)that have investigated PPD and reported a

prevalence of 19.8% (95% CI: 19.5% -20%)[16]. Most of these studies (88%) were after 2002, and 29% were conducted in tertiary teaching hospitals[16]. The authors reported significant difference in PPD prevalence toward self-report tools where prevalence of PPD was 20.8% (95% CI: 20-21.6) from diagnostic assessment tools were PPD prevalence was 16.09% (95% CI: 14.6-17.6) [16].

2.1.4. The systematic reviews about PPD risk factors in developing countries:

Klainin and Arthur[27] classified PPD associated factors in Asia into 5 categories which are: psychological, obstetric and pediatric, socio-demographic, physical and biological, and lastly cultural factors. Factors that significantly predicts PPD were depression during pregnancy or postpartum blue, other psychiatric illness during pregnancy, previous history of depression, stress over childcare and difficult temperament of the newborn, experiencing stressful life events, low social support and marital satisfaction, low self-esteem, undesired or unplanned pregnancy and lower socio-economic status, anxiety during pregnancy, premenstrual dysphoric disorder, pregnancy complications, previous abortion, lack of breast feeding, the need for emergent delivery due to maternal or fetal problems, lack of husband's education or employment, polygamy, conflict with mother-in-law or other in-law relatives[27]. It can be noticed that all of these factors belong to the first 3 categories and are mainly psycho-social in nature.

Biological and physical factors were investigated in scattered studies which linked PPD to low Body Mass Index (BMI),[29] higher number of physician visits and lower physical activity[30] which may be a result of the depressed mood rather than a precipitating factor. The authors also discussed in details many traditions and cultural practices that have been used by many Asian cultures in the puerperal period like using or avoiding specific diets, movement restriction, help to mother by female relatives and other rituals[27]. The association of such rituals with PPD was conflicting. The authors argument that whilst some practices like doing the homemaking by relatives may relax and help the mother, other restrictions especially by mother-in-laws and many old-fashioned myths and practices may increase mothers' anxiety and depression[27].

Factors associated with PPD in Africa were classified into socio-demographic, pregnancy and birth-related and psychological variables[28]. Whilst psychological factors were strongly associated with PPD, some socio-demographic and pregnancy and birth-related factors were not significantly associated with PPD in all the studies. Psychological factors were marital and family conflict, lacking social support, and being depressed or unhappy during pregnancy[28]. Mother's age, education level, employment and socio-economic status were not associated with PPD in most of the studies, whilst being a single mother and polygamy were significantly associated with PPD[28]. Pregnancy and birth-related factors followed a mixed pattern as mode of delivery, parity, pregnancy complications, preterm or low birth weight baby, unplanned or unwanted

pregnancy and infant gender were significantly associated with PPD in some studies and has no significant relationship with PPD in others[28]. Interestingly, where mode of delivery was significantly associated with PPD, it is the Caesarean section or instrumental delivery that carries more risk to PPD rather than the vaginal delivery[28]. Overall, this study was good in figuring out prevalence and risk factors of PPD in Africa with the limitation of the use on English only literature as many African countries are French speaking countries.

Lastly, Fisher et al. conducted a systematic review of the risk factors of common Perinatal mental disorders (CPMD) which refers to depression and anxiety before and after birth and classify these factors into socio-economic factors, partner relationship factors, family and social relationship factors, adverse reproductive outcomes, mental health history factors, infant factors and lastly the protective factors against PPD[16]. For each factor, the authors listed the minimum and the maximum odds ratio (OR) and it 95% confidence interval (CI).

The socio-economic risk factors were: low socioeconomic status (reflected by insufficient food, inability to pay for healthcare, low income or financial difficulties, unemployed partner and living in crowded or inadequate housing or rural area) with OR of 2.1 to 13.2 [95% CI: 1.3-33.5], younger mother's age with OR of 2.1 to 5.4 [95% CI: 0.7-10.3], being of ethnic or religious minority with OR of 2.1 [95% CI: 1.0-4.0] and being unmarried with OR of 3.4 to 5.8 [95% CI: 2.0-16.9] [16]. Difficulties in the relationship with intimate partner, like the partner rejecting paternity, being

unsupportive and uninvolved, quarrelsome and excessive alcoholic predicted PPD with OR ranged from 1.96 to 9.44 [95% CI: 1.0-37.8], whilst physical violence OR ranged from 2.11 to 6.75 [95% CI: 1.1-4.0] and polygamous marriage OR was 7.7 [95% CI: 2.3-25.9] [(16)]. Other family factors that predicted PPD were: conflict with in-laws [OR= 2.14 to 4.4; 95% CI: 1.1-10.8], insufficient social support [OR= 2.8 to 6.1; 95% CI: 1.2-26] and having more than 2 children [OR= 2.6 to 4.3; 95% CI: 0.9-19] [(16)].

PPD risk factors related to pregnancy and birth complications were: unwanted or unintended pregnancy [OR= 1.6 to 8.8; 95% CI: 1.3-17.5], primiparity [OR= 2.73 to 4.16; 95% CI: 1.4-7.7], previous abortion [OR= 2.87, 95% CI: 1.0-8.0], previous stillbirth [OR= 3.4 to 8.0; 95% CI: 1.3-37.6], coincidental medical problems [OR= 3.43 to 8.3; 95% CI: 1.8-14.5], hospital admission during pregnancy [OR= 3.21 to 3.95; 95% CI: 1.8-6.1] and Caesarean delivery [OR= 2.49 to 19.9; 95% CI: 1.4-122] [(16)]. Infant factors that associated with PPD were: having newborn opposite to the desired sex which was mostly having a female newborn [OR= 1.8 to 2.6; 95% CI: 1.2-6.5], prolonged crying periods [OR= 1.9; 95% CI: 1.2-3.0] and ill infant health [OR= 4.5 to 14.1; 95% CI: 2.5-78] [(16)].

Having a past mental illness [OR= 5.1 to 5.6; 95% CI: 1.1-27.3], psychiatric morbidity during pregnancy [OR= 3.2 to 6; 95% CI: 1.4-12] and poor perception and difficult coping with pregnancy complications [OR= 2.2 to 19.9; 95% CI: 1.4-122] were associated with the occurrence of PPD in low and lower- middle-income countries[(16)]. Lastly, Fisher et al. concluded 5 protective factors against PPD which were: more education

years [relative risk (RR) = 0.5, p 0.03], having a secure job [OR= 0.64, 95% CI: 0.4-1.0], employed partner [RR= 0.3. p 0.002], being of ethnic majority [OR= 0.2, 95% CI: 0.1-0.8] and receiving traditional postpartum care from a trusted person [OR= 0.4 to 1.9; 95% CI: 0.3-3.2] [16].

It can be noticed that there a wide variation of the degree and power of association of these factors with PPD and that most of the factors has an extremely wide 95% confidence interval of the odds ratio, which means less precise estimates and may be reflected by the small sample sizes of these studies. However, many factors are similar to those found to predict PPD in developing countries which were concluded by large meta-analyses. Another important notice that can be noticed in the studies reviewing risk factors in developed countries is the presence of risk factors specific to these countries like the female gender of the newborn and being of an ethnic minority which reflects the cultural context in these countries.

2.2. Postpartum depression in Arab countries:

2.2.1. PPD prevalence in Arab countries:

A substantial variation exists in the methods that have been used to investigate PPD. Thus, it is very important to have an idea of these differences in order to understand the widely varying prevalence rates resulting from these studies.

A systematic review of the peer-reviewed journal published studies investigating the prevalence of PPD in Arab populations was done by Ayoub, Shaheen and Hajat and included 13 studies till 2012[31]. The authors identified differences and variations between studies in the tools used for

screening or diagnosis of postpartum depression; the timing of PPD investigation (soon after birth or months later); the setting where investigation occurred (community survey, primary care clinics or tertiary hospitals); the cut off scores to identify PPD for the same tool; the sampling representativeness and sample size as many studies used convenient samples with small sizes; the response rates; and lastly the inclusion and exclusion criteria used (i.e. excluding or including groups with higher risk of PPD like mothers with pregnancy complications) [(31)].

The first study investigating PPD in Arab population was conducted by Ghubash and Abou-Saleh in Dubai in UAE in 1994[(32)]. The researchers recruited 95 mothers from a hospital in Dubai 2 days after birth, and screened PPD with Edinburgh Postnatal Depression Scale (EPDS) at 7 days postpartum (with a cut off score of ≥ 12) and re-assessed them with Present State Examination (PSE) diagnostic tool at 8 and 30 weeks postpartum. The prevalence of PPD was 17.8%, 15.8% and 4.2% at 1 week, 8 weeks and 30 weeks respectively[(32)].

Another study was conducted in Egypt almost in the same period [(33)] and recruited 158 primigravida mothers in their 3rd trimester from antenatal clinics in community maternal and child health centres (MCHCs) using EPDS and found the prevalence of antepartum depression to be 25.32%. Another follow up interview was done at 6-16 weeks postpartum with 72 mothers only, but the rate of PPD was not reported (as only the abstract was available) [(33)].

Later, two other studies were conducted in UAE. The first recruited 125 mothers from a hospital in Abu Dhabi and assessed PPD with EPDS (cut off ≥ 13) at 3 and 6 months postpartum and reported PPD prevalence of 22.1% and 12.5% at 3 and 6 months respectively[34]. This study also identified mothers with borderline depression (EPDS cut off 10-12) who were 22.1% and 19.6% of the participating mothers at 3 and 6 months respectively[34]. The second study recruited 137 mothers from Maternal and Child Health Clinic (MCHC) in Sharjah during their 2nd trimester of pregnancy. The prevalence of PPD at 2 months postpartum was assessed using Mini International Neuropsychiatric Interview (MINI) and EPDS (cut off ≥ 12) and reported PPD prevalence of 10.1% and 10.8% with MINI and EPDS respectively[35].

Al- Dallal and Grant investigated 237 randomly selected mothers from 58 MCHCs chosen randomly from all over Bahrain at the time of 2 months vaccination visits (2 months postpartum) with the use of EPDS (cut off ≥ 12) and reported a surprisingly high prevalence of 37.1%[36]. Similarly, Bener et al. investigated 1,397 mothers in 12 primary care centers across Qatar during the first 6 months postpartum with the use of EPDS (cut off ≥ 12) reporting a prevalence of 17.6%[37].

In Lebanon, Chaaya et al. recruited 583 mothers from 9 hospitals in Beirut and the rural Bekaa' Valley (303 mothers from Beirut and 235 from Bekaa') and assessed PPD with EPDS (cut off ≥12) at 3-5 months postpartum. They found a PPD prevalence of 21% with a statistically significant difference between urban and rural areas (16% vs. 26%)[38].

Mohammed et al. recruited 353 mothers from outpatient clinic of a teaching hospital and 5 MCHC in Irbid in Jordan during their 3rd trimester and assessed PPD with EPDS (cut off ≥ 13) [17]. They reported a PPD prevalence of 22.1% and 21.2% at 6-8 weeks and 6 months postpartum[17].

Lastly, Glasser et al. studied the PPD prevalence in Palestinian Arab women in northern Israel using secondary data from routine screening with EPDS in the 58 MCHCs in Acre area. They studied the data of 2,326 mothers screened during their first 6 months postpartum and reported a prevalence of 16.3% using cut off score of ≥ 10 and 8% using a cut off score of ≥ 13[39]. Table 2.1. summarizes these studies and other studies conducted in Arab countries.

2.2.2. PPD risk factors and predictors in Arab countries:

2.2.2.1. PPD and socio-demographic factors:

Many socio-demographic factors were investigated by various studies. Most Arab studies found no relationship between mother's age, education, mother's employment and PPD[34-36, 40, 41]. However, Chaaya et al. reported higher PPD rates among low and highly educated mothers compared to medium educated mothers[38]. Bener et al. reported higher PPD in Qatari mothers who have low education[37].

The most important socio-demographic risk factor of PPD is low income and socioeconomic status (SES)[37, 39, 42, 43]. Surprisingly, it was also noticed that high income or socioeconomic status (SES mothers have higher PPD than average income and SES mother's in some studies, but of course less than those with low income and SES[39, 42].

2.2.2.2. PPD and pregnancy, birth and infant related factors:

Arabic studies investigated a number of pregnancy and birth related factors and their relationship to PPD. Complications during pregnancy or birth like bleeding and preeclampsia and the presence of a medical disease like diabetes and hypertension were significantly associated with PPD among Arab mothers[37, 38, 40, 41].

The number of births (parity) and whether the pregnancy under investigation is the first pregnancy showed no significant association with PPD in almost all studies[36-38, 40-42]. The relationship between PPD and whether the pregnancy was planned or wanted is controversial. While some studies found it to be associated with occurrence of PPD,[17, 32, 41, 42] many others reported it as non-significantly associated with PPD[36-38, 40].

Table 2.1: Summary of studies about the prevalence of postpartum depression in Arab countries

Study & year	Country	No. of participants	Recruitment Setting	Time of investigation	Tools used	Cut-off	Prevalence
Ghubash & Abou-Saleh (1997) [32]	UAE, Dubai	95	Tertiary hospital	2nd day PP 7th day PP 8 ±2 wks PP 30 ±2 wks PP	SRQ EPDS PSE =	- ≥ 12 -	24.5% 17.8% 15.8% 4.2%
Chaaya et al (2002) [38]	Lebanon, Beirut and Bekaa Valley	583 [303 urban +235 rural]	9 hospitals	3-5 mo	EPDS	≥ 12	21% (26% rural 16% urban)
Agoub et al (2005) [40]	Morocco, Casablanca	144	MCH clinic	2-3 wks PP = 6 wks PP 6 mo PP 9 mo PP	EPDS MINI MINI = =	≥ 12 - -	20.1% 18.7% 6.9% 11.8% 5.6%
Alami et al (2006) [41]	Morocco, Casablanca	100	MCH clinic	2-3wk PP 12 wk PP 24 wk PP 36 wk PP postpartum	MINI = = = EPDS	 ≥ 13	16.8% 14% 12% 6% 21%
Green et al (2006) [34]	UAE, Abu Dhabi	125	Hospital	3mo 6mo	EPDS = EPDS =	≥ 13 10-12 ≥ 13 10-12	22.1% 22.1% 12.5% 19.6%
Masmoudi et al (2008) [43]	Tunisia, Sfax	213	Tertiary hospital	1st wk PP 6-10 wks PP	EPDS =	≥ 10	19.2% 13.2%

Study & year	Country	No. of participants	Recruitment Setting	Time of investigation	Tools used	Cut-off	Prevalence
Hamdan & Tamim (2011) [35]	UAE, Sharjah	137	MCH clinic	2 mo PP	MINI EPDS =	- ≥ 10 ≥ 12	10.1% 16.8% 10.8%
Mohammad et al (2011) [17]	Jordan, Irbid	353	Teaching hospital and 5 MCH clinics	6-8 wks 6 mo	EPDS =	≥ 13	22.1% 21.2%
Glasser et al (2011) [42]	Bedouin Palestinians in Israel	104	MCH clinic	Within 3mo of birth	EPDS in Hebrew	≥10 ≥13	43% 26%
Glasser et al (2012) [39]	Palestinians in Northern Israel	2,326	58 MCH clinic	6 wks PP	EPDS =	≥ 10 ≥ 13	16.3% 8%
Al Dallal & Grant (2012) [36]	Bahrain	237	20 PHCC+ 2 clinics	8wks PP	EPDS =	≥ 12	37.1%
Bener et al. (2012) [37]	Qatar	1,397	12 PHCC	During first 6mo PP	EPDS	≥ 12	17.6%

SRQ: Self-Report Questionnaire. **PSE:** Present State Examination tool. **MINI:** Mini International Neuropsychiatric Interview. **PP:** Postpartum. **EPDS:** Edinburgh Postnatal Adopted from*: Ayoub et al. postpartum depression in the Arab countries: a systematic review*[31].

Bener et al. reported higher PPD rate in women giving birth by Caesarean section (CS) compared to those giving birth vaginally[37]. Chaaya et al. found similar findings in the rural mothers of Bekaa' Valley, while urban mothers of Beirut reported higher PPD when they gave birth vaginally[38].

Moreover, Mohammad et al. investigated many negative experiences during labor including longer labor duration, need of episiotomy and suturing, dissatisfaction with pain relief during labor, dissatisfaction with care provided by medical staff and the feeling of stress and loss of control during labor which all were significantly associated with higher rate of PPD reflecting the relationship between birth trauma and PPD[17].

Having a female baby increased the rate of PPD in Jordanian mothers,[17] but not in Moroccan, Qatari or Bahraini[36, 37, 40]. Newborns who are ill, premature or low weight predispose mothers to PPD in some studies,[32, 37, 40, 41] while others showed no significant relationship[34, 36]. In addition, mothers who use formula feeding were more likely to be depressed than those who breast fed their infants[35, 37].

2.2.2.3. PPD and marital and family relationship factors:

Poor marital relationship or marital conflict, poor husband support or help and physical or verbal violence of husband toward his wife, all were strongly associated with high PPD rates in almost all Arabic studies[17, 32, 36, 37, 40, 41, 43].

Although the relationship with the mother's own family (mainly her mother) showed non-significant association with PPD rates,[34, 36] mothers with perceived low family and social support were at significantly higher

risk of PPD[17, 37, 38]. As in other developing countries, where in-laws have a great effect on the family affairs, the presence of conflict in relationships with mother-in-law predisposed mothers to higher risk for developing PPD[17, 34, 37].

2.2.2.4. PPD and psychosocial factors:

Personal history of depression or mental illness and depression during pregnancy under investigation are two major predictors of PPD in Arab mothers[17, 32, 35, 36, 38, 43]. The assessment of depression during pregnancy differs between studies. While many researchers used self report measures by only asking the mother if she has had depression or depressive symptoms during pregnancy,[36, 38] other studies started investigation during pregnancy and assessed ante-natal depression using standardized screening and diagnostic tools in order to have more reliable assessment[17, 35].

Another strong PPD predictor is the experience of stressful life event during pregnancy or during the last year. Ghubash and Abou-Saleh found that mothers who were exposed to stressful life events were about 15 times more predisposed to PPD than those non-exposed[32]. Similar results were observed in Moroccan and Jordanian women[17, 40, 41]. Some of these studies particularly investigated the effect of major financial difficulties or difficulties to manage with income and their effect on PPD. Unsurprisingly, financial problems were the most stressful life event associated with higher PPD rate[17, 37, 41].

In conclusion, prevalence of PPD in developing and Arab countries is about 1.5 times higher than that of developed countries, despite the wide

variation in prevalence estimates due to differences in methods used in investigating this phenomenon. Moreover, major confirmed risk factors are the same in the all parts of the world, while those probable and possible risk factors vary in their predisposition to PPD between different settings. It is worthy to note that some risk factors are characteristic of some developing countries including Arab countries, such as giving birth to a female baby and having conflicts in relationships with mother-in-law[16, 17].

Chapter Three
Methodology

3.1. Study Design:

This study was a cross-sectional, observational and analytical study to estimate the prevalence and factors associated with postpartum depression (PPD) in Nablus district.

3.2. Study setting, timing and sampling:

The study was conducted in Maternal and Child Health (MCH) clinics and Primary Health Care (PHC) clinics that offer vaccination services in Nablus district. Nablus is the largest governorate in Northern West Bank with an estimated total population of 356,129 in 2012[44]. In addition to Nablus city, Nablus governorate or district consists of 61 communities or localities: 7 urban (>5,000 people); 51 rural (<5,000 people); and 3 refugee camps[44]. The total number of live births in Nablus district was 8,603 in 2011 where 99.5% of births occur in hospital settings (51.4% in governmental and 48.1% in non-governmental hospitals) [45].

There are 42 MCH and PHC clinics offering vaccination services and affiliated to Ministry of Health (MOH) in Nablus district[46]. In addition, United Nations Relief and Work Agency (UNRWA) has 5 clinics offering vaccination services for camp population[47]. The list of these clinics and the average number of newborn registered and vaccinated monthly is shown in annex1. The Palestinian vaccination program includes vaccination at the following times following birth: first day after birth; 1, 2, 4, 6, 9, 12 and 18 months after birth with vaccination rate approaches 100%[48]. Although 98.9% of Palestinian pregnant women in 2010 have received antenatal care, only 40.5% of them received antenatal care in MOH clinics[45, 49]. This percentage is lower in Nablus district and reaches

32.1%. Moreover, only 19% of mothers visited MOH physicians and 63% visited MOH nurses for postnatal care[45]. This may be due to the follow up with private physicians while vaccination is only offered at MOH and UNRWA.

In fact, many previous studies chose to conduct their investigation of PPD at vaccination clinics due to higher adherence of mothers to vaccination visits compared to antenatal and postnatal visits[36, 40, 41]. This study were conducted at 7-12 weeks (2-3 months) postpartum during the second month vaccination visit in 12 clinics conveniently chosen from the clinics list including 9 village clinics, 2 camp clinics and one city clinic. These clinics were chosen after classification of clinics to 5 geographical clusters: Nablus city, Nablus camps, North-Western villages, South-Eastern villages and South-Western villages. The best effort was done to include clinics from all areas of Nablus district, but sometimes a clinic of higher work load was chosen especially in the small villages where there is a small number of mothers each month as the study time and resources were limited. The chosen clinics are shown in annex 1A.

3.3. The population of the study:

The study population was mothers aged 18-45 years in Nablus district who are visiting MCH and PHC clinics in the MOH and UNRWA at 7-12 weeks after birth to vaccinate their children.

Inclusion criteria were: 1) Age 18-45 years; 2) Mothers who gave birth 2 months ago [2 months passed postpartum] ; 3) Ability to communicate in Arabic; and 4) Signing the informed consent. Except for not meeting the inclusion criteria, there were no exclusion criteria.

3.4. The sample of the study:

A convenient sample was chosen of mothers attending to vaccinate their children at 7-12 weeks after birth in city, villages and camp clinics. Although convenient sampling is not representative of the population under investigation, it saved a lot of cost and time.

The formulas used for sample size estimation for a proportion are used mainly for random sampling approach[50]. Nevertheless, it was used here to give an approximation of the number of mothers needed to be investigated.

The prevalence of postpartum depression is estimated to be 20% similar to that reported in Jordan[17]. Using a confidence level of 95% and a margin of error of 5%, the sample size needed was 246.

$$n = \frac{z^2 * p(1-p)}{e^2}$$

Where: n = required sample size; z = confidence level at 95% (standard value of 1.96); p = estimated prevalence of postpartum depression; e = margin of error at 5% (standard value of 0.05)

3.5. The study tool:

A questionnaire was specifically designed by the researcher to investigate the prevalence of postpartum depression at 2-3 months postpartum and its associated factors.

The questionnaire consisted of six sections: socio-demographic section; pregnancy and birth related (obstetric) section; newborn characteristics section; marital and family relationships section; psycho-social variables and psychological history section; and lastly, an Arabic version of

Edinburgh Postnatal Depression Scale (EPDS) that was validated in Jordan, [18] was used to screen mother for postpartum depression.

Moreover, a committee of three specialists (Dr. Jawad Fatayer, a clinical psychologist and a professor of psychology; Dr. Mariam Al-Tal, a midwife and an assistant professor. in community nursing; and Dr. Amira Shaheen, an assistant professor in public health) assessed the face and content validity of the tool, and suggested some minor modifications and the manner of asking the questions. The tool of the study is attached in annexes (the Arabic tool in annex 2 and English version in annex 3)

3.5.1. Socio-demographic factors:

Socio-demographic variables include age, age at marriage, residence (city, village or camp), years of education, occupation and monthly income. Moreover, another question about the type of health insurance if exists.

3.5.2. Pregnancy and birth related factors:

This section consists of 9 questions: the first is about obstetric history were women were asked about the number of pregnancies (gravidity), the number of births (parity), the number of abortions and stillbirths and the number of alive children. The second question is about obstetric complications during the last pregnancy which are: gestational hypertension or preeclampsia, gestational diabetes, antepartum hemorrhage, threatened abortion, preterm labor or delivery, anemia and severe vomiting and dizziness.

The other questions are about the place of delivery; type of delivery; the use of vacuum assisted delivery; whether there was episiotomy and

suturing; whether the mother wanted the pregnancy to occur; and mother's overall satisfaction with the medical care during birth on a scale from 1-5.

The last question was about any medical problems or chronic disease the mother may have (i.e. hypertension, diabetes, asthma, cardiac disease, rheumatoid arthritis or other diseases).

3.5.3. Newborn related factors:

This section consists of 6 questions: the gender of the newborn; the mother desired gender of the newborn; whether the newborn has any diseases or he was admitted to a neonatal intensive care unit; whether the newborn was delivered before the ninth month (premature); and whether he is fed by breastfeeding, formula or both.

3.5.4. Marital and family relationship factors:

This section consists of five Likert scale questions of 5 points each. The mothers were asked to rate the relationship with her husband, the support and help provided by her husband, the relationship with her own family (mother, father, brothers and sisters), the relationship with her mother-in-law and the relationship with her husband's family. The 5 points ranged from 1 as very poor to 5 as very good.

In addition, a translated version of the Maternal Social Support Scale (MSSS) by Webster et al. was used for further assessment of social support. (51) The MSSS is a 6-item 5-point Likert scale about the mother's perceived social support. Four items (friends' support, family support, husband's help and husband's love) are rated from 1-5 as never, rarely, some of the time, most of the time and always. On the other hand, the

remaining 2 items (there is a conflict with my husband and I feel controlled by my husband) are reversely scored[51]. The maximum score is 30 and the final score is classified as: low support (0-18), medium support (19-24) and adequate support (>24) [51]. The MSSS was used in Jordan after translation to Arabic and low social support using MSSS was found to be a significant predictor of antepartum and postpartum depression[17]. The Cronbach's alpha of MSSS was 0.90 during pregnancy and 6-8 weeks postpartum[17]. The author's permission was taken to translate and use the tool.

3.5.5. Psycho-social and psychological history factors:

This section consists of four questions. Three questions are about personal history of mental illness, family history of mental illness and history of depression during the last pregnancy.

The fourth question assesses the experience of 11 stressful life events during the last year or during the last pregnancy. These events were investigated by other studies and found to be significantly associated with postpartum depression[17, 35]. They are: being away from a dear beloved person, workplace conflict, recurrent verbal abuse, marital separation or divorce, housing problems or change, a serious illness of the mother or a beloved person, hitting or physical abuse, difficulties dealing with children, financial difficulties, accidents or injuries and the death of a beloved person.

3.5.6. Edinburgh Postnatal Depression Scale (EPDS):

Edinburgh Postnatal Depression Scale (EPDS) is the most widely used tool for screening for PPD worldwide[52]. In addition to its ease of

administration, EPDS has very good psychometric properties, uncomplicated interpretation and high acceptance of mothers[52]. EPDS is a 10- item self report scale with each item consists of a 4-point scale rated from (0-3) making the total score ranging from (0-30) [53]. Each item is asking about the mother experience of feelings (e.g. depressed mood, loss of interest in things, guilt, loss of sleep and suicidal ideation) during the last 7 days.

The original study for EPDS validation adopted a cut off score ≥ 12 for the diagnosis of depression with a sensitivity and specificity of 86% and 78% respectively[53]. EPDS was translated and validated in Arabic against Present State Examination (PSE) diagnostic test, resulting in high Cronbach's α (internal consistency) of 0.84, sensitivity of 73% and specificity of 90% using cut off ≥ 12. The use of ≥ 10 cut off score increased sensitivity to 91% and decreased specificity to 84%[54]. Other Arabic studies that used EPDS for screening with Mini International Neuropsychiatric Interview (MINI) for diagnosis reported higher sensitivity with less decrease in specificity at cut off score of ≥ 10 instead of ≥ 12,[35, 40] while some studies used cut off scores and classified PPD as major if EPDS score > 12 and minor if it was 10-12[34, 39, 42]. In conclusion, it is advised to use a lower threshold of ≥ 10 for community screening with EPDS while using the cut off score >12 (≥ 13) to identify major depressive symptoms[4, 52].

In this study, an Arabic version of EPDS that was validated in Jordan [18] was used and the permission from the study author Dr. Arwa Oweis was

taken. EPDS ≥ 10 was adopted to define depression whereas EPDS ≥ 13 was considered severe depression.

3.6. Study Procedure:

After assessing the study tool for comprehensiveness before and during the pilot study, the participants were chosen conveniently from mothers visiting MOH and UNRWA affiliated MCHCs and PHCs to vaccinate their 2 months old babies in 12 clinics in Nablus district. The mothers who fulfilled inclusion criteria were informed about aims and nature of this research by the interviewers and they were asked to sign the informed consent of agreement before answering the interview questions.

The participating mothers were interviewed by one of the nurses in a place of the clinic that offers privacy to the interview. In order to assure confidentiality and privacy of the interview, the following measures were taken: Firstly, the interview papers were anonymous and they only had a serial number. Secondly, the marital and family relationships section were filled by the participant after explanation from the interviewer and then kept in a sealed envelope until the stage of data analysis. Moreover, the sections asking about sensitive information were delayed to the end of the interview. The interviews were conducted by 2 registered nurses who received a one day training on how to conduct the interview in the same manner to minimize interviewer bias.

3.7. The pilot study:

The pilot study was conducted before starting the major study to assess comprehensiveness and internal consistency of the tool and to assess the time needed to complete the interview. No modifications were made on the final questionnaire. The internal consistency (Cronbach's α) of EPDS in the

pilot study was 0.71, and Cronbach's α of MSSS was 0.48. The results of the pilot study are presented briefly in annex 6.

3.8. Data handling and Analysis:

The data were handled and analyzed using SPSS16. After data entry and cleaning from missing data and outliers, the analysis was done as the following:

3.9.1. Descriptive analysis:

All variables were summarized using the mean and standard deviation for continuous variables and frequencies and percentage for categorical variables. Annex 4 lists the study variables and their description.

3.9.2. Inferential statistics:

Bivariate analysis was done using chi square test and Fisher exact test (when cells numbers are <5) to check for any significant difference at $\alpha = 0.05$ in the categorical independent variables between depressed and non-depressed mothers according to EPDS score (the dependent variable). Lastly, logistic regression was done to figure out the significant predictor variables that predict postpartum. The level of significance (α) was 0.05.

3.9. Ethical consideration:

Informed consent was signed by participants after verbal explanation by the interviewing nurses to ensure compliance. An-National University Institutional Review Board (IRB) approval was taken and appropriate permissions were taken from MOH and UNRWA before starting the study (see annex 5).

Chapter Four

Results

4.1. General Description:

A total of 247 interviews were performed between the end of May and the mid of July 2013. Twelve interviews were excluded: 2 were invalid and 10 have incomplete one or more items of the EPDS so depression status cannot be determined. The total number of interviews included in the analysis was 235. The time of interview ranged from 7-12 weeks after birth with a median of 9 weeks. The mean postpartum weeks at the time of the interview was 9.08 (SD ±0.7) and the 95% CI ranged from 8.99 to 9.17 weeks. One of the nurses performed 127 (54%) of the interviews and the other nurse performed the remaining 108 (46%).

Al-Markaziya (i.e. the central) clinic was the main city clinic, whereas Amman street clinic which is located in Nablus city receives mixed city and neighboring villages populations. In addition, 7 village clinics and 3 camp clinics were included in the study. The details of study clinics and their percentage of the study sample are presented in Figure 4.1.

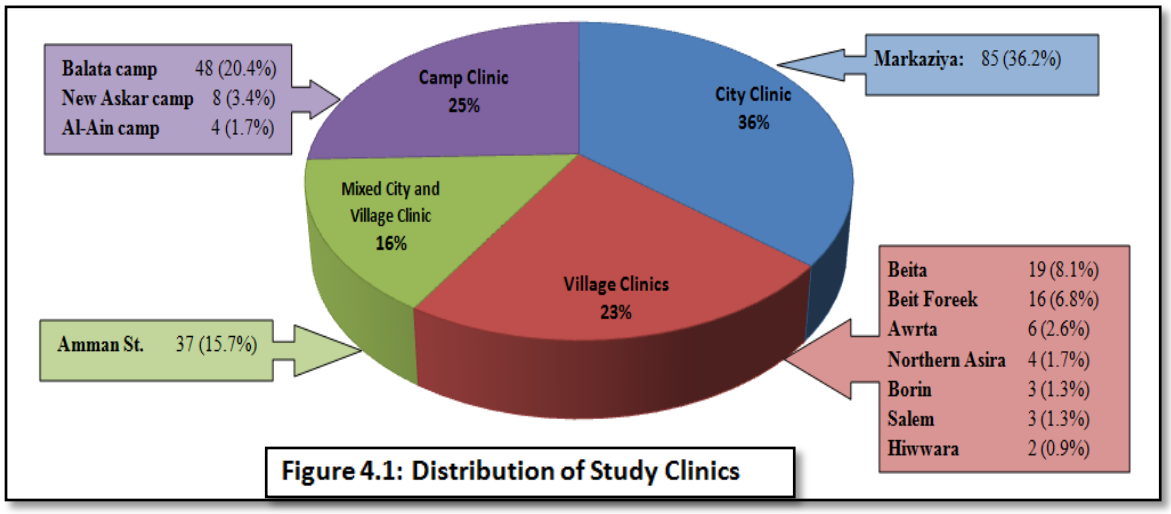

Figure 4.1: Distribution of Study Clinics

4.2. Descriptive Statistics:

4.2.1. Socio-demographic Characteristics:

The age of the participating mothers ranged from 18 to 41 years with a mean of 26.13 (SD ±5.3) years and the median age was 25 years. The age at marriage ranged from 14 to 30 years with a mean of 20.6 (SD ±3.24) years and a median of 20 years. More than 40% of mothers achieved post-secondary school education, and the mean and median years of education were 12.6 and 12 respectively. Despite the high rate of education, only 10% of the participating mothers were employed and the remaining 90% were housewives.

As income is one of the important socio-demographic variables, the participating mothers were asked about their total family income, in addition to the total number of the family members and those who are under 18 years of old. Income ranged from 900 to 12,000 Israeli shekels with a median of 2,500 shekels. 44.3% of the mothers reported that their total family income was less than 2,500 shekels which is approximates the Palestinian national poverty line of 2,300 shekels. *[In 2011, the poverty line in the Palestinian territories was 2,293 shekels (637$) and the deep poverty line was 1,832 shekels (509$)]*[55]. It is worthy to mention that 25 mother preferred not to mention their income level. The number of family members (including the mother and her husband) ranged from 3 to 14 with a median of 5 members. The median number of family members < 18 years of old was 2. The income to family member ratio, which reflects how the proportion of the total income obtained by each family member, ranged from 100 to 3,333 shekels per family member with a median of 500 shekels per family member. The income to family member ratio may produce more

accurate measure of the economic status of the family as it measures the individual income approximately. Half of the participating mothers have an income to family member ratio of less or equal to 500 shekels per family member. 27.2% have a ratio of 501-1000 shekels per family member, and only 10.2% have a ratio of more than 1000 shekels per family member.

Almost 80% of participating mothers had health insurance and many of these women living in camps actually had two types of insurance, the UNRWA and the governmental health insurance. 61.3% of the mothers had a governmental insurance, 24.7% had UNRWA insurance, 7.23% had private insurance, 3.8% had military insurance. Actually many families have two types of insurance whilst 20.4% had no insurance at all. Table 4.1 summarizes the socio-demographic characteristics of the participants.

4.2.2. Pregnancy and birth-related factors:

The number of pregnancies among participating mothers ranged from 1 to 12 with a mean of 2.8 (SD ±1.90) [95% CI: 2.59- 3.07] and the number of live births also ranged from 1-12 with a mean of 2.56 (SD ±1.64) [95% CI: 2.38- 2.79]. Abortions ranged from 0 to 4 abortions with a mean of 0.27 (SD ±0.65) abortions [95% CI: 0.18- 0.34]. 72.8% of mothers reported that their last pregnancy was desired, whilst 27.2% reported that they did not desire to be pregnant.

Seven factors were surveyed as possible complications during pregnancy. The most prevalent complication was vomiting and dizziness (71.5%), followed by anemia (28.1%) and gestational hypertension and preeclampsia (7.2%). The other complications, antenatal bleeding, threatened abortion, gestational diabetes and preterm labor affected only 1-3% of the participating mothers. 26.4% of the participants experienced 2 or more of

the mentioned complications during their pregnancy, 57.9% experienced one of them and 15.7% did not experience any of these complications. Figure 4.2. lists the prevalence of each complication during pregnancy.

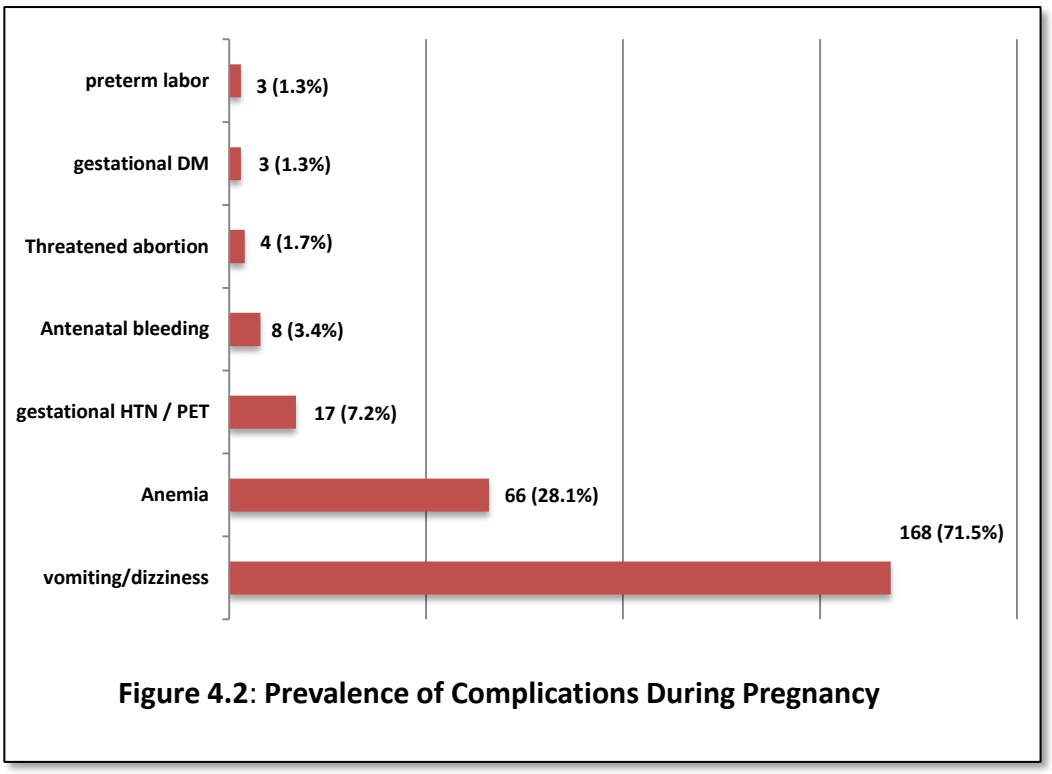

Figure 4.2: **Prevalence of Complications During Pregnancy**

The participating mothers were also asked about the presence of chronic diseases during the last pregnancy. 223 (94.9%) of mothers reported having no chronic disease at all, whilst 11 (4.7%) mothers reported one diseases and only one mother reported having more than one disease. Hypertension affected 5 (2.1%) of mothers, followed by cardiovascular disease that affected 3 (1.3%) of mothers, whilst each of rheumatoid arthritis, hypothyroidism and sickle cell disease affected only one mother. No mothers were affected with diabetes or asthma.

Table 4.1: The Socio-demographic Characteristics of the Participants.

Variable	Categories			Total	Mean [95% CI]	edi
Age	**17-24 years**	**25-34 years**	**35-44 years**			
n (%)	100 (42.6%)	116 (49.4%)	19 (8.0%)	235 (100%)	26.13 [25.45-26.81]	25
Residence	**City**	**Village**	**Camp**			
n (%)	117 (49.8%)	70 (29.8%)	48 (20.4%)	235 (100%)	-	-
Education	**6 years or less**	**7-12 years**	**> 12 years**			
n (%)	8 (3.4%)	125 (53.2%)	102 (43.4%)	235 (100%)	12.59 [12.20-12.98]	12
Occupation	**Housewife**	**Employed**	**-**			
n (%)	211 (89.8%)	24 (10.2%)	-	235 (100%)	-	-
Income	**< 2500 shekels**	**2500-5000 shekels**	**> 5000 shekels**			
n (%)	104 (44.3%)	81 (34.5%)	25 (10.6%)	210 (89.4%)	3014.5 [2734.5-3294.5]	2500
Income: family member	**≤ 500 shekels/ member**	**501-1000 shekels/ member**	**> 1000 shekels/ member**			
n (%)	120 (51.1%)	64 (27.2%)	24 (10.2%)	208 (88.5%)	-	-
Insurance	**Has insurance**	**No insurance**	**-**			
n (%)	187 (79.6%)	48 (20.4%)	-	235 (100%)	-	-
Insurance	**Govern-mental**	**Military**	**UNRWA**	**Private**		
n (%)	144 (61.3%)	9 (3.8%)	58 (24.68%)	17 (7.23%)	-	-

One third of the mothers were primipara (i.e. giving birth for the first time). All mothers gave birth in hospitals. 52.3% gave birth in public governmental hospitals, whilst 41.3% and 6.4% gave birth in private and UNRWA hospitals respectively. Two thirds of the participating mothers delivered their babies by vaginal delivery, 2.6% reported the use of vacuum

during delivery and 48.5% reported that episiotomy was done during birth. Table 4.2 summarizes the birth-related variables of the participants.

The mean satisfaction with medical care during birth was 3.67 (SD ± 1.14) on a scale of 5, with 95% confidence interval (CI) ranged from 3.52to 3.82 and the median satisfaction was 4. Thirty percent of mothers reported receiving excellent medical care during birth and 25.1% and 31.1% reported that the medical care was very good and good respectively. In contrast, 8.9% and 4.7% reported that the medical care during birth was satisfactory and poor respectively. In summary, 86% of mothers reported good medical care during birth whilst 13.6% reported poor care.

Table 4.2: Summary of Birth-related Characteristics of the Participants.

Variable	Categories		
Place of birth	**Governmental Hospital**	**Private Hospital**	**UNRWA Hospital**
n (%)	123 (52.3%)	97 (41.3%)	15 (6.4%)
Type of birth	**Vaginal**	**Caesarean Section**	-
n (%)	160 (68.1%)	75 (31.9%)	-
Use of Vacuum	**Yes**	**No**	-
n (%)	6 (2.6%)	229 (97.4%)	-
Episiotomy	**Yes**	**No**	-
n (%)	114 (48.5%)	121 (51.5%)	-
Desired pregnancy	**Yes**	**No**	-
n (%)	171 (72.8%)	64 (27.2%)	-
Primiparity	**Yes**	**No**	-
n (%)	73 (31.1%)	162 (68.9%)	-

4.2.3. Baby factors:

48.9% of the participating mothers gave birth to a male baby and 50.6% gave birth to a female. In addition one mother gave birth to a twin of male and female. When the mothers were asked about the preferred or desired sex of their baby, 28.5% chose a male, 24.3% chose a female and 47.2%

answered that there was no difference. 21.7% of the mothers delivered babies with the opposite sex they desire while 77.9% delivered a baby similar to the desired sex or they did not matter with the sex of the baby.

Almost none of the mothers reported that their baby was ill, but 12.8% reported that the baby needed Neonatal Intensive Care Unit (NICU) admission soon after birth. 16.2% of the mothers reported that their baby was premature or delivered before completing 9 months of pregnancy. Two thirds of the mothers reported that breastfeeding is the sole feeding type, 28.1% reported the use of both breast and formula feeding and only 6.8% reported using formula feeding exclusively. Table 4.3 summarizes the newborn-related variables in the study.

4.2.4. Psychological factors and mental history:

People may deny having personal or family mental history due to the stigma of the mental illness, so the questions about mental history were open questions. The participating mothers were asked about if they or their families had in the past or are having now any mental illness including depression, including illnesses that needed the help of a psychiatrist. Only four mothers (1.7%) reported having personal mental history and the same number admitted having positive family mental history. When the question comes to having depression during the last pregnancy, 25.1% answered yes. Table 4.4 summarizes the psychological history factors in the study participants.

The participating mothers were asked about 11 psychosocial stressors (Figure 4.3) and if they have experienced any of them during the last year or during their pregnancy. The most reported stressor was financial difficulties affecting 54.9% of mothers, followed by difficulties dealing with children (25.1%), death of a dear person (12.3%), severe illness to the mother or a dear person (11.1%), being away from a dear person (10.2%), problems in housing (6%), marital separation or divorce (5.1%), accidents or injuries (4.3%), verbal harassment (3.4%), physical abuse (1.7%) and lastly problems or conflict at work (0.4%).

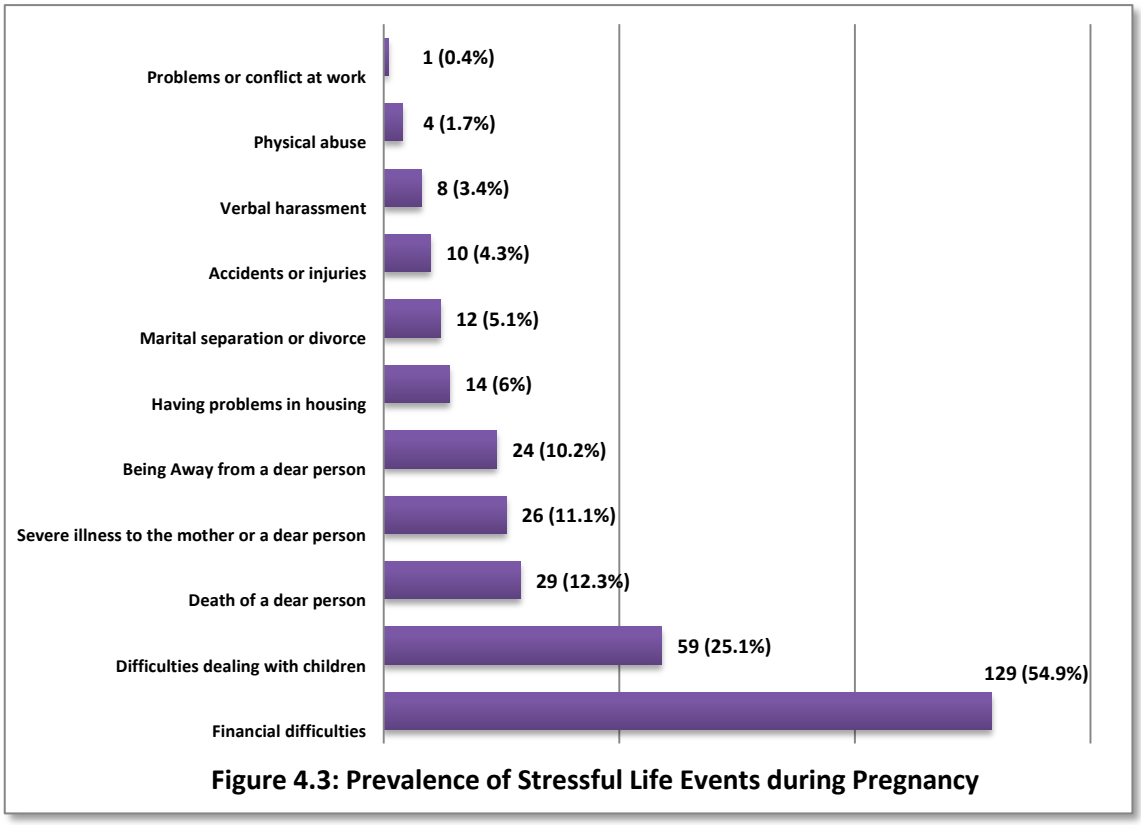

Figure 4.3: Prevalence of Stressful Life Events during Pregnancy

Table 4.3: Summary of Newborn-related Characteristics in the study.

Variable	Categories		
Newborn Sex	**Male**	**Female**	**-**
n (%)	115 (48.9%)	119 (50.6%)	-
Desired Newborn Sex	**Male**	**Female**	**No difference**
n (%)	67 (28.5%)	57 (24.3%)	111 (47.2%)
Baby's sex agreement With mother's desire	**Agree or no difference**	**Do not agree**	**-**
n (%)	183 (77.9%)	51 (21.7%)	
Newborn Illness	**Yes**	**No**	-
n (%)	1 (0.4%)	234 (99.6%)	-
NICU Admission	**Yes**	**No**	-
n (%)	30 (12.8%)	205 (87.2%)	-
Premature Newborn	**Yes**	**No**	-
n (%)	38 (16.2%)	197 (83.8%)	-
Feeding Type	**Breast Feeding**	**Formula Feeding**	**Breast & Formula Feeding**
n (%)	153 (65.1%)	16 (6.8%)	66 (28.1%)

Table 4.4: Psychological factors among Study Participants

Variable	Categories		
Personal mental history	**Yes**	**No**	**Don't know**
n (%)	4 (1.7%)	228 (97%)	3 (1.3%)
Family mental history	**Yes**	**No**	**Don't know**
n (%)	4 (1.7%)	231 (98.3%)	-
Depression during pregnancy	**Yes**	**No**	**Don't know**
n (%)	59 (25.1%)	176 (74.9%)	-
Number of stressful events	**No stressful events**	**One stressful event**	**2 or more stressful events**
n (%)	48 (20.4%)	111 (47.2%)	76 (32.3%)

4.2.5. Marital and family relationships factors:

Table 4.5 summarizes the marital and family relationship variables. The participating mothers were asked four questions regarding their satisfaction

and evaluation of their relationship with their husbands, their own families and their mother-in-laws. The fourth question was about help and support offered by the husband. The answers ranged from 1 to 5 as very poor, poor, satisfactory, good and very good. In general, most mothers reported high scores of these questions with a median of 4-5. The responses good and very good were grouped as good relationship. 223 mothers (94.9%) reported good marital relationship with their husbands, 185 (78.7%) reported good help and support from husbands and 232 (98.7%) reported good relationship with their own family; whereas 187 (79.6%) reported good relationships with their mother-in-law. Twenty one (8.9%) mothers did not answer the question about the relationship with the mother-in-law, and many of these (10 mothers) reported that their mother-in-laws are dead. The degree of social support was also assessed by using the Maternal Social Support Scale (MSSS). The reliability of the scale (Cronbach's α) was 0.46. Ten mothers did not answer one of the 6 questions of the MSSS so their score could not be calculated and they were omitted from the analysis of the social support. The scores of MSSS ranged from 10 to 30 with a median score of 24. The mean score was 23.88 (±3.56) and the 95% CI ranged from 23.42 to 24.34. Most mothers reported high and medium support, with percentages of 46% and 43.4% respectively, and only 6.4% reported receiving low social support according to the MSSS.

Table 4.5: Summary of the Social Support and Family Relationship Satisfaction of the Participants

Variable	Mean (SD) [95% CI]	Median	Very poor N (%)	Poor N (%)	Satisfactory N (%)	Good N (%)	Very good N (%)	Total
Relationship With Husband	4.38 (0.63) [4.30-4.46]	4	1 (0.4)	1 (0.4)	10 (4.3)	119 (50.6)	104 (44.3)	235
Help And Support By Husband	3.87 (0.91) [3.75-3.99]	4	8 (3.4)	12 (5.1)	30 (12.8)	138 (58.7)	47 (20)	235
Relationship With Own Family	4.51 (0.53) [4.44-4.58]	5	0	0	3 (1.3)	109 (46.4)	123 (52.3)	235
Relationship With Mother-In-Law	4.14 (0.85) [4.03-4.25]	4	5 (2.1)	6 (2.6)	16 (6.8)	113 (48.1)	74 (31.5)	214
MSSS	**Mean (SD) [95% CI]**	**Median**	**Low N (%)**	**Medium N (%)**	**High N (%)**	-	-	**Total**
MSSS score and categories	23.88 (3.56) [23.42-24.34]	24	15 (6.4)	102 (43.4)	108 (46.0)	-	-	225

MSSS: Maternal Social Support Scale

4.3. Prevalence of Postpartum Depression:

The reliability of The Edinburgh Postnatal Depression Scale (EPDS), (Cronbach's α) was 0.79. The scores ranged from 0 to 28 with a median score of 3 and a mean of 5.03 (SD ±4.93). The 95% CI of the mean ranged from 4.39 to 5.66.

The cut off score 9/10 (≥ 10) was used to define depressed mothers and 12/13 (≥ 13) to define severe depression. Forty mothers (17%) were

depressed and score ≥ 10 on EPDS. Further classification of the depressed mothers showed that 19 mothers (8.1%) were moderately depressed and scored 10-12 on EPDS, whilst 21 mothers (8.9%) were severely depressed and score ≥ 13. It is also important to note that 7 mothers (3%) answered positively in the 10th EPDS question about suicidal ideation. The question asked "The thought of harming myself has occurred to me". One mother answered "yes, quite often"; 4 mothers answered "sometimes" and 2 mothers answered "hardly ever".

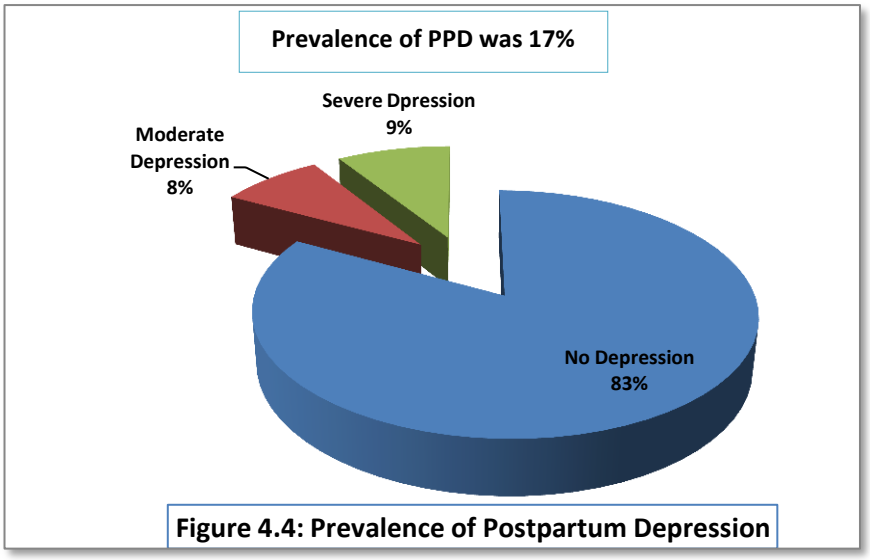

Figure 4.4: Prevalence of Postpartum Depression

4.4. Factors associated with PPD:

4.4.1. Socio-demographic Characteristics:

The association of the socio-demographic variables with postpartum depression was tested. None of the socio-demographic variables: age, residence, education, occupation, total family income and income to family member ratio, and the presence of health insurance were significantly associated with postpartum depression (EPDS cut off ≥ 10) at α level of 0.05 as shown in table 4.6.

4.4.2. Pregnancy and Birth-related Factors:

The association of the pregnancy and birth-related variables with postpartum depression was tested. None of the pregnancy and birth-related variables were significantly associated with postpartum depression (EPDS cut off ≥ 10) at α level of 0.05 as shown in table 4.7. There was no significant association between postpartum depression and the presence of pregnancy complications: gestational hypertension or preeclampsia, gestational diabetes, antenatal bleeding, threatened abortion, vomiting and dizziness, and anemia. There was also no significant association with the number of these complications.

Table 4.6: Association between PPD and Socio-demographic Variables

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Age	**17-24 years**	22 (22%)	78 (78%)	100	1	0.211
	25-34 years	16 (13.8%)	100 (86.2%)	116	0.57 [0.28-1.15]	0.117
	35-44 years	2 (10.5%)	17 (89.5%)	19	0.37 [0.08-1.72]	0.266
Residence	**City**	24 (20.5%)	93 (79.5%)	117	1	0.360
	Village	9 (12.9%)	61 (87.1%)	70	0.57 [0.25-1.31]	0.187
	Camp	7 (14.6%)	41 (85.4%)	48	0.66 [0.26-1.66]	0.378
Education	**6 years or less**	1 (12.5%)	7 (87.5%)	8	1	0.145
	7-12 years	27 (21.6%)	98 (78.4%)	125	1.93 [0.23-16.36]	0.547

	> 12 years	12 (11.8%)	90 (88.2%)	102	0.93 [0.11-8.26]	0.951
Occupation	**Housewife**	39 (18.5%)	172 (81.5%)	211	1	0.089
	Employed	1 (4.2%)	23 (95.8%)	24	0.19 [0.03-1.46]	
Income	**< 2500 shekels**	21 (20.2%)	83 (79.8%)	104	1	0.828
	2500-5000 shekels	14 (17.3%)	67 (82.7%)	81	0.83 [0.39-1.75]	0.617
	> 5000 shekels	4 (16.0%)	21 (84.0%)	25	0.75 [0.23-2.43]	0.635
Income to family member ratio	**≤ 500 shekels/ member**	24 (20.0%)	96 (80.0%)	120	1	0.666
	501-1000 shekels/ member	11 (17.2%)	53 (82.8%)	64	1.20 [0.55-2.65]	0.644
	> 1000 shekels/member	3 (12.5%)	21 (87.5%)	24	1.75 [0.48-6.35]	0.395
Insurance	**No insurance**	33 (17.7%)	153 (82.3%)	186	0.77 [0.32-1.87]	0.567
	Has insurance	7 (14.3%)	42 (85.7%)	49		

Birth-related variables: the place of birth, the route of birth whether vaginal or Cesarean section (CS), the use of vacuum or episiotomy, and the satisfaction with medical care during birth, were not significantly associated with postpartum depression. Depressed mothers were not statistically different from non-depressed in the presence of chronic diseases, primiparity (i.e. giving birth for the first time), and whether the pregnancy was desired or not.

Table 4.7.a: Association between PPD and Pregnancy and Birth Variables (pregnancy)

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Gestational HTN / PET	**Yes**	1 (5.9%)	16 (94.1%)	17	0.35 [0.05-2.71]	0.319*
	No	39 (17.9%)	179 (82.1%)	218		
Gestational DM	**Yes**	0 (0%)	3 (100%)	3	-	0.99*
	No	40 (17.2%)	192 (82.8%)	232		
Preterm labor	**Yes**	0 (0%)	3 (100%)	3	-	0.99*
	No	40 (17.2%)	192 (82.8%)	232		
Antenatal bleeding	**Yes**	1 (12.5%)	7 (87.5%)	8	0.69 [0.08-5.76]	0.99*
	No	39 (17.2%)	188 (82.8%)	227		
Threatened abortion	**Yes**	1 (25.0%)	3 (75.0%)	4	1.64 [0.17-16.2]	0.528*
	No	39 (16.9%)	192 (83.1%)	231		
Vomiting and dizziness	**Yes**	32 (19.0%)	136 (81.0%)	168	1.74 [0.76-3.99]	0.191
	No	8 (11.9%)	59 (88.1%)	67		
Anemia	**Yes**	16 (24.2%)	50 (75.8%)	66	1.93 [0.95-3.93]	0.066
	No	24 (14.2%)	145 (85.8%)	169		
Number of obstetrical complication	**No complications**	4 (10.8%)	33 (89.2%)	37	1	0.304
	One complication	22 (16.2%)	114 (83.8%)	136	1.59 [0.51-4.95]	0.421
	> 1 complication	14 (22.6%)	48 (77.4%)	62	2.41 [0.72-7.96]	0.150

* Fisher's exact test

4.4.3. Baby factors:

The association of the baby characteristics with postpartum depression was tested. Only newborn prematurity (delivery before the 9th month) was significantly associated with postpartum depression (EPDS cut off ≥ 10), where 5.3% of the mothers who have premature newborn were depressed compared to 19.3% of those with term babies, [OR= 0.23, 95% CI: 0.05-1.0; p 0.035] as shown in table 4.8. Other baby characteristics: baby's sex,

agreement between baby's sex and the mother's desired sex, whether the baby was ill or admitted to Neonatal Intensive Care Unit (NICU), and the type of baby's feeding, all were not significantly associated with mother's postpartum depression.

Table 4.7.b: Association between PPD and Pregnancy and Birth Variables (birth)

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Place of birth	**Governmental hospital**	24 (19.5%)	99 (80.5%)	123	1	0.422
	Private hospital	15 (15.5%)	82 (84.5%)	97	0.94 [0.46-1.89]	0.436
	UNRWA hospital	1 (6.7%)	14 (93.3%)	15	0.37 [0.05-2.92]	0.249
Type of birth	**Vaginal**	25 (15.6%)	135 (84.4%)	160	0.74 [0.36-1.50]	0.405
	Caesarean	15 (20.0%)	60 (80.0%)	75		
Vacuum use	**Yes**	3 (50.0%)	3 (50.0%)	6	5.19 [1.0-26.71]	0.063*
	No	37 (16.2%)	192 (83.8%)	229		
Episiotomy	**Yes**	18 (15.8%)	96 (84.2%)	114	0.84 [0.43-1.67]	0.626
	No	22 (18.2%)	99 (81.8%)	121		
Desired pregnancy	**Yes**	26 (15.2%)	145 (84.8%)	171	0.64 [0.31-1.32]	0.226
	No	14 (21.9%)	50 (78.1%)	64		
Intrapartum care satisfaction	**Poor**	4 (36.4%)	7 (63.6%)	11	1	0.100
	Satisfactory	3 (14.3%)	18 (85.7%)	21	0.29 [0.05-1.65]	0.163
	Good	6 (8.2%)	67 (91.8%)	73	0.15 [0.04-0.69]	0.014
	Very good	13 (22.0%)	46 (78.0%)	59	0.49 [0.13-1.95]	0.315
	Excellent	14	56	70	0.44	0.234

		(20.0%)	(80.0%)		[0.11-1.71]	
Intrapartum care Satisfaction (binary)	**Poor**	7 (21.9%)	25 (87.1%)	32	1.43 [0.57-3.59]	0.439
	Good	33 (16.3%)	169 (83.7%)	202		
Presence of chronic diseases	**Yes**	3 (25.0%)	9 (75.0%)	12	1.68 [0.43-6.49]	0.435*
	No	37 (16.6%)	186 (83.4%)	223		
Primiparity	**Yes**	11 (15.1%)	62 (84.9%)	73	0.81 [0.38-1.73]	0.593
	No	29 (17.9%)	133 (82.1%)	162		

* Fisher's exact test

Table 4.8: Association between PPD and Newborn-related Variables

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Newborn sex	**Male**	25 (21.7%)	90 (78.3%)	115	1.93 [0.96-3.88]	0.064
	Female	15 (12.6%)	104 (87.4%)	119		
Newborn sex agreement	**Yes or no difference**	30 (16.3%)	154 (83.7%)	184	0.80 [0.36-1.77]	0.579
	No	10 (19.6%)	41 (80.4%)	51		
Newborn illness	**Yes**	1 (100.0%)	0 (0%)	1	-	0.170*
	No	39 (16.7%)	195 (83.3%)	234		
Newborn NICU admission	**Yes**	6 (20.0%)	24 (80.0%)	30	1.26 [0.48-3.31]	0.642
	No	34 (16.6%)	171 (83.4%)	205		
Premature newborn	**Yes**	2 (5.3%)	36 (94.7%)	38	0.23 [0.05-1.0]	***0.035****
	No	38 (19.3%)	159 (80.7%)	197		
Newborn feeding	**Breast feeding**	22 (14.4%)	131 (85.6%)	153	1	0.323
	Formula feeding	4 (25.0%)	12 (75.0%)	16	1.98 [0.59-6.71]	0.270
	Both breast & formula feeding	14 (21.2%)	52 (78.8%)	66	1.60 [0.76-3.37]	0.213

* Fisher's exact test

4.4.4. Psychological factors and mental history:

The association of the psychological and mental history factors with postpartum depression was tested. 75% of mothers reported a personal history of mental illness or depression and 52.5% of mothers reported having depression during pregnancy have PPD compared to 16% and 5% of those who do not have these conditions, [OR= 15.72, 95% CI: 1.59-155, p 0.016; and OR= 20.54, 95% CI: 8.84-47.74, p < 0.001, respectively], as shown in table 4.9. On the other hand, the presence of a family history of a mental illness or depression was not associated with postpartum depression.

Six of the tested 11 stressful life events during pregnancy were significantly associated with the presence of postpartum depression. These were: being away from a dear person (50% has PPD compared to 13% of not reporting this event), [OR= 6.54, 95% CI: 2.67-15.97, p < 0.001], verbal harassment (75% has PPD compared to 15% of not reporting this event), [OR= 17.03, 95% CI: 3.29-87.91, p < 0.001], marital separation or divorce (41.7% has PPD compared to 15.7% of not reporting this event), [OR= 3.84, 95% CI: 1.15-12.77, p 0.035], severe illness of the mother or a dear person (38.5% has PPD compared to 14.4% of not reporting this event), [OR= 3.73, 95% CI: 1.55-8.99, p 0.002], physical abuse (75% has PPD compared to 16% of not reporting this event), [OR= 15.73, 95% CI: 1.59-155.3, p 0.016], and difficulties dealing with children (35.6% has PPD compared to 10.8% of not reporting this event), [OR= 4.57, 95% CI: 2.23-9.33, p < 0.001]. On the other hand, Problems or conflict at work, housing problems, accidents or injuries, death of a dear person, and unexpectedly financial difficulties were not significantly associated with postpartum depression. Finally, the number of stressful events was significantly

associated with the presence of postpartum depression, where 34.2%, 9.9% and 6.2% of mothers who reported 2 or more, one and no stressful events, respectively were depressed. [OR for 2 or more stressful events = 7.8, 95% CI: 2.21-27.53, p < 0.001].

Table 4.9.a.: Association between PPD and Psychological Variables

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Personal mental history	**Yes**	3 (75.0%)	1 (25.0%)	4	15.72 [1.59-155]	***0.016****
	No or don't know	37 (16.0%)	194 (84.0%)	231		
Family mental history	**Yes**	2 (50.0%)	2 (50.0%)	4	5.08 [0.69-37.18]	0.135*
	No or don't know	38 (16.5%)	193 (83.5%)	231		
Depression during pregnancy	**Yes**	31 (52.5%)	28 (47.5%)	59	20.54 [8.84-47.74]	< ***0.001****
	No	9 (5.1%)	167 (94.9%)	176		

* Fisher's exact test

4.4.5. Marital and family relationships factors:

The association of the psychological and mental history factors with postpartum depression was tested. Postpartum depression (EPDS cut off ≥ 10) was significantly associated with poor husband and marital relationship satisfaction with PPD rate of 66.7% and 14.3% among mothers reporting poor and good relationship respectively, [OR= 11.49, 95% CI: 3.39-41.97, p < 0.001], poor husband help and support with PPD rate of 42% and 10.3% among mothers reporting poor and good help and support respectively, [OR= 6.33, 95% CI: 3.03-13.2, p < 0.001], and poor mother-in-law relationship satisfaction with PPD rate of 29.6% and 13.9% among mothers reporting poor and good relationship respectively [OR= 2.6, 95% CI: 1.03-6.57, p 0.037] as shown in table 4.10. On the other hand, there was

no significant association between postpartum depression and the mother's own family relationship satisfaction.

Lower social support as perceived on the Maternal Social Support Scale (MSSS) was also significantly associated with the presence of postpartum depression, with PPD rate of 40%, 24.5% and 4.6% among mothers reporting low, medium and high social support respectively.

Table 4.9.b.: Association between PPD and Psychological Variables (Stressful life events)

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Away from a dear person	**Yes**	12 (50.0%)	12 (50.0%)	24	6.54 [2.67-15.97]	< ***0.001****
	No	28 (13.3%)	183 (86.7%)	211		
Problems or conflict at work	**Yes**	0 (0%)	1 (100.0%)	1	-	0.999
	No	40 (17.1%)	194 (82.9%)	234		
Verbal harassment	**Yes**	6 (75.0%)	2 (25.0%)	8	17.03 [3.29-87.91]	< ***0.001****
	No	34 (15.0%)	193 (85.0%)	227		
Marital separation or divorce	**Yes**	5 (41.7%)	7 (58.3%)	12	3.84 [1.15-12.77]	***0.035****
	No	35 (15.7%)	188 (84.3%)	223		
Housing problems	**Yes**	5 (35.7%)	9 (64.3%)	14	2.95 [0.93-9.33]	0.068
	No	35 (15.8%)	186 (84.2%)	221		
Severe illness of mother or a dear person	**Yes**	10 (38.5%)	16 (61.5%)	26	3.73 [1.55-8.99]	***0.002****
	No	30 (14.4%)	179 (85.6%)	209		
Hitting and physical abuse	**Yes**	3 (75.0%)	1 (25.0%)	4	15.73 [1.59-155.3]	***0.016****
	No	37 (16.0%)	194 (84.0%)	231		
Difficulties dealing with children	**Yes**	21 (35.6%)	38 (64.4%)	59	4.57 [2.23-9.33]	< ***0.001****
	No	19 (10.8%)	157 (89.2%)	176		
Financial difficulties	**Yes**	25 (19.4%)	104 (80.6%)	129	1.46 [0.72-2.93]	0.289
	No	15 (14.2%)	91 (85.8%)	106		
Accidents	**Yes**	1 (10.0%)	9 (90.0%)	10	0.53	0.999*

or injuries	**No**	39 (17.3%)	186 (82.7%)	225	[0.07-4.30]	
Death of a dear person	**Yes**	8 (27.6%)	21 (72.4%)	29	2.07 [0.84-5.08]	0.106
	No	32 (15.5%)	174 (84.5%)	206		
Number of stressful events	**no stressful events**	3 (6.2%)	45 (93.8%)	48	1	< 0.001
	one stressfu event	11 (9.9%)	100 (90.1%)	111	1.65 [0.44-6.20]	0.459
	> 1 stressful events	26 (34.2%)	50 (65.8%)	76	7.8 [2.21-27.53]	0.001

Table 4.10: Association between PPD and Social Support and Family Relationships Variables

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Husband &Marital relationship satisfaction	**Poor**	8 (66.7%)	4 (33.3%)	12	11.94 [3.39-41.97]	< ***0.001****
	Good	32 (14.3%)	191 (85.7%)	223		
Husband help & support	**Poor**	21 (42.0%)	29 (58.0%)	50	6.33 [3.03-13.20]	< ***0.001***
	Good	19 (10.3%)	166 (89.7%)	185		
Own family relationship satisfaction	**Poor**	2 (66.7%)	1 (33.3%)	3	10.21 [0.90-115.5]	0.076
	Good	38 (16.4%)	194 (83.6%)	232		
Mother-in-law relationship satisfaction	**Poor**	8 (29.6%)	19 (70.4%)	27	2.61 [1.03-6.57]	***0.037***
	Good	26 (13.9%)	161 (86.1%)	187		
Maternal Social Support Scale (MSSS)	**Low**	6 (40.0%)	9 (60.0%)	15	13.73 [3.50-53.96]	***<0.001***
	Medium	25 (24.5%)	77 (75.5%)	102	6.96 [2.45-18.26]	***<0.001***
	High	5 (4.6%)	103 (95.4%)	108	1	***<0.001***

* Fisher's exact test

4.5. Summary of the factors with significant association with postpartum depression:

Table 4.11 summarizes the factors that have statistically significant associations with postpartum depression. These were: premature newborn, a personal history of mental illness or depression, depression during pregnancy, higher number of stressful life events during pregnancy, poor satisfaction with the relationships with the husband, poor satisfaction with the help and support provided by the husband, poor satisfaction with the relationships with the mother-in-law and low perceived social support.

4.6. Factors significantly associated with severe postpartum depression:

The same factors that were associated with postpartum depression were also associated with severe postpartum depression (EPDS $\geq$ 13) at α level of 0.05, with the addition of having a male baby, [OR= 2.83, 95% CI: 1.05-7.56, p 0.032] and poor family relationship satisfaction, [OR= 22.42, 95% CI: 1.94-258.7, p 0.022] as shown in the table 4.12.

Table 4.12 shows the stressful life events during pregnancy that were associated with severe postpartum depression. These were similar to those associated with postpartum depression in addition to financial difficulties, [OR= 2.86, 95% CI: 1.01-8.09, p 0.04].

Table 4.11: Factors Significantly Associated with Postpartum Depression

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Premature newborn	**Yes**	2 (5.3%)	36 (94.7%)	38	0.23 [0.05-1.0]	***0.035****
	No	38 (19.3%)	159 (80.7%)	197		
Personal mental history	**Yes**	3 (75.0%)	1 (25.0%)	4	15.72 [1.59-155]	***0.016****
	No or don't know	37 (16.0%)	194 (84.0%)	231		
Depression during pregnancy	**Yes**	31 (52.5%)	28 (47.5%)	59	20.54 [8.84-47.74]	< ***0.001****
	No	9 (5.1%)	167 (94.9%)	176		
Number of stressful events	**No stressful events**	3 (6.2%)	45 (93.8%)	48	1	< 0.001
	One stressful event	11 (9.9%)	100 (90.1%)	111	1.65 [0.44-6.20]	0.459
	> 1 stressful events	26 (34.2%)	50 (65.8%)	76	7.8 [2.21-27.53]	0.001
Husband &Marital relationship satisfaction	**Poor**	8 (66.7%)	4 (33.3%)	12	11.94 [3.39-41.97]	< ***0.001****
	Good	32 (14.3%)	191 (85.7%)	223		
Husband help & support	**Poor**	21 (42.0%)	29 (58.0%)	50	6.33 [3.03-13.20]	< ***0.001***
	Good	19 (10.3%)	166 (89.7%)	185		
Mother-in-law relationship satisfaction	**Poor**	8 (29.6%)	19 (70.4%)	27	2.61 [1.03-6.57]	***0.037***
	Good	26 (13.9%)	161 (86.1%)	187		
Maternal Social Support Scale (MSSS)	**Low**	6 (40.0%)	9 (60.0%)	15	1	< ***0.001***
	Medium	25 (24.5%)	77 (75.5%)	102	0.49 [0.16-1.50]	< ***0.001***
	High	5 (4.6%)	103 (95.4%)	108	0.07 [0.02-0.29]	< ***0.001***

* Fisher's exact test

Table 4.12.a: Factors Significantly Associated with Severe Postpartum Depression

Variable	Categories	Depressed	Non-depressed	Total	OR [95% CI]	p value
Premature newborn	**Yes**	2 (5.3%)	36 (94.7%)	38	0.23 [0.05-1.0]	***0.035****
	No	38 (19.3%)	159 (80.7%)	197		
Newborn sex	**Male**	15 (13.0%)	100 (87.0%)	115	2.83 [1.05-7.56]	***0.032***
	Female	6 (5.0%)	113 (95.0%)	119		
Personal mental history	**Yes**	3 (75.0%)	1 (25.0%)	4	35.5 [3.51-358.9]	***0.002****
	No or don't know	18 (7.8%)	213 (92.2%)	231		
Depression during pregnancy	**Yes**	17 (28.8%)	42 (71.2%)	59	17.4 [5.56-54.4]	***0.002****
	No	4 (2.3%)	172 (97.7%)	176		
Number of stressful events	**No stressful events**	1 (2.1%)	47 (97.9%)	48	1	***< 0.001***
	One stressful event	3 (2.7%)	108 (97.3%)	111	1.31 [0.13-12.88]	***0.819***
	> 1 stressful events	17 (22.4%)	59 (77.6%)	76	13.54 [1.74-105.5]	***0.013***
Husband & Marital relationship satisfaction	**Poor**	5 (41.7%)	7 (58.3%)	12	9.24 [2.63-32.43]	***< 0.001***
	Good	16 (7.2%)	207 (92.8%)	223		
Husband help & support	**Poor**	9 (18.0%)	41 (82.0%)	50	3.16 [1.25-8.0]	***0.011***
	Good	12 (6.5%)	173 (93.5%)	185		
Family relationship satisfaction	**Poor**	2 (66.7%)	1 (33.3%)	3	22.42 [1.94-258.7]	***0.022****
	Good	19 (8.2%)	213 (91.8%)	232		
Mother-in-law relationship satisfaction	**Poor**	7 (25.9%)	20 (74.1%)	27	4.68 [1.67-13.11]	***0.002***
	Good	13 (7.0%)	174 (93.0%)	187		
Maternal Social Support Scale (MSSS)	**Low**	5 (33.3%)	10 (66.7%)	15	1	***0.001***
	Medium	11 (10.8%)	91 (89.2%)	102	0.24 [0.07-0.84]	***0.018***
	High	2 (1.9%)	106 (98.1%)	108	0.04 [0.006-0.22]	***< 0.001***

* Fisher's exact test

Table 4.12.b: Stressful Life Events Significantly Associated with Severe Postpartum Depression7

Variable	Categories	Non-depressed	Depressed	Total	OR [95% CI]	p value
Away from a dear person	**Yes**	15 (62.5%)	9 (37.5%)	24	9.95 [3.62-27.35]	***< 0.001***
	No	199 (94.3%)	12 (5.7%)	211		
Verbal harassment	**Yes**	2 (25.0%)	6 (75.0%)	8	42.4 [7.87-228.4]	***< 0.001****
	No	212 (93.4%)	15 (6.6%)	227		
Marital separation or divorce	**Yes**	8 (66.7%)	4 (33.3%)	12	6.06 [1.65-22.19]	***0.015****
	No	206 (92.4%)	17 (7.6%)	223		
Severe illness of mother or a dear person	**Yes**	18 (69.2%)	8 (30.8%)	26	6.7 [2.45-18.29]	***< 0.001***
	No	196 (93.8%)	13 (6.2%)	209		
Physical abuse	**Yes**	1 (25.0%)	3 (75.0%)	4	8.71 [3.32-22.82]	***0.002****
	No	213 (92.2%)	18 (7.8%)	231		
Difficulties dealing with children	**Yes**	45 (76.3%)	14 (23.7%)	59	7.51 [2.86-19.72]	***< 0.001***
	No	169 (96.0%)	7 (4.0%)	176		
Financial difficulties	**Yes**	113 (87.6%)	16 (12.4%)	129	2.86 [1.01-8.09]	***0.040*** ***0.064****
	No	101 (95.3%)	5 (4.7%)	106		

* Fisher's exact test

4.7. Logistic Regression Analysis:

All the previous associations were concluded by univariate analysis mainly chi square tests. The issue of having statistically significant results by chance only is very important here due to the high numbers of tested variables. This will also increase the number of confounding factors, so all variables that were significantly associated with PPD ($p < 0.05$) (Table 4.11) and with severe PPD ($p< 0.05$) (Table 4.13) were inserted into a binary logistic regression model to figure out the most important predictors of postpartum depression among Palestinian mothers in this study. Non-significant factors were not included into the regression to avoid large number of covariates.

Only 2 of the 10 factors included in the regression model were significant predictors of PPD. The most significant PPD predictor was depression during pregnancy, [OR= 11.21, 95% CI: 3.79- 33.19, p < 0.001]. Surprisingly and interestingly, having a female baby predicted lower PPD rate [OR= 0.17, 95% CI: 0.04- 0.68, p 0.012]. The details of regression analysis model are shown in Table 4.13 were significant predictors are written in bold.

Table 4.13: The Logistic Regression Model of The Factors Predicting The Occurrence of PPD

Variables included in the regression model	B	S.E.	OR [95% CI]	P value
Depression during pregnancy	*2.417*	*0.554*	***11.21 [3.79- 33.19]***	***< 0.001***
Having a female baby	*-1.245*	*0.551*	***0.29 [0.098- 0.85]***	***0.024***
Poor satisfaction with marital relationship	*1.694*	*0.937*	*5.44 [0.87- 34.16]*	*0.071*
Low social support category	*0.886*	*0.502*	*2.43 [0.91- 6.49]*	*0.078*
Premature newborn	*-0.180*	*0.893*	*0.84 [0.15- 4.81]*	*0.841*
Personal mental history	*1.563*	*1.418*	*4.77 [0.30- 76.83]*	*0.270*
More than 2 stressful events	*0.563*	*0.375*	*1.76 [0.84- 3.66]*	*0.133*
Poor satisfaction with help and support by husband	*0.770*	*0.626*	*2.16 [0.63- 7.36]*	*0.219*
Poor satisfaction with relationship with mother-in-law	*0.362*	*0.799*	*1.44 [0.30- 6.87]*	*0.651*
Poor satisfaction with relationship with own family	*0.280*	*2.250*	*1.32 [0.02- 108.83]*	*0.901*
Constant	***-4.041***	***0.750***	***0.018***	***< 0.001***

B: beta coefficient; S.E.: standard error of B; OR: odds ratio; CI: confidence interval;
Regression method :Enter

Chapter Five

Discussion

This observational and analytical cross-sectional study, to the best of author's knowledge, is the first to investigate the prevalence and associated factors of postpartum depression among Palestinian women (in the West Bank and Gaza). A well-structured interview was conducted by two trained nurses with 247 mothers in 12 clinics along Nablus district two months after giving birth. Of the 235 valid interviews, 40 mothers scored ≥ 10 on Edinburgh Postnatal Depression Scale (EPDS) and were considered to screen positive for PPD. Among these women, 21 mothers (8.9%) scored ≥ 13 on EPDS and were considered severely depressed.

Postpartum depression was significantly associated with depression during pregnancy, higher number of stressful life events during pregnancy, poor satisfaction with the relationships with the husband, poor satisfaction with the help and support provided by the husband, low perceived social support, a personal history of mental illness or depression, premature newborn and poor satisfaction with the relationships with the mother-in-law. The following sections will discuss the context and implications of these results in addition to the limitations of this study.

5.1. Characteristics of the Study Sample:

Although the study sample was a convenient sample, many efforts were done to represent the study population. These include the distribution of the study clinics which were chosen from all areas of Nablus district and included city, village and refugee camp populations. Moreover, the sample size was large enough to estimate the PPD prevalence with a good statistical power.

Table 5.1 lists some of the similarities in the distribution of some variables between the study sample and the counterpart population.

Table 5.1. Selected comparison between the sample and Palestinian population characteristics

Variable	Study Sample	West Bank	Palestinian Population
Fertility	-	4 (2008-2009)	4.4 (2008-2009)
Average number of births	2.56 (±1.64)	4.1 (2008-2009)	4.3 (2008-2009)
Average family size	5.47	5.2 (2012)	5.5 (2012)
Median age at first marriage	20 (mean 20.6 ± 3.24)	20.2 (2012)	20.1 (2012)
Employment rate of females	10%	13% (actually working 2013)	11% (actually working 2013)
Caesarean birth	31.9%	-	21.9% (2013)
Place of birth - **Governmental** - **Private**	 52.3% 41.3%	 50.5% (2013) 48.8% (2013)	-

Sources of information: 1) Ministry of Health, Palestinian Health Information Center (PHIC), Health Report for Mid-year 2013, MOH, Palestine, 2013. 2) Palestinian Central Bureau of Statistics (PCBS), The Conditions of Palestinian People Living in Palestine 2013, Ramallah, Palestine, 2013.

5.1.1. Socio-demographic Characteristics:

It can be noticed that the age distribution of the participating mothers is skewed to the right as more women of younger age are getting pregnant and giving birth. Most of the participants have achieved good education and more than 40% achieved post-secondary education, as it is well known that Palestinian women are among the most educated women in the Arab World[0]. Nevertheless, most of these mothers are unemployed, but the rate of unemployment is almost similar to the national level, as less job opportunities are available in comparison to the number of graduating

students and many employers prefer male work force because they tend to tolerate harder work conditions.

Half of the sample reported low income as 44.3% reported income less than 2500 shekels which is approximate to the Palestinian poverty line[56]. Another measure to assess income was created by dividing the reported total income by the family size to generate income: family member ratio. 51.1% of the participating mothers have income: family member ratio less than 500 shekels monthly which is considered low as the average monthly individual expenditure in Palestine was 807 shekels in 2011[56].

5.1.2. Pregnancy and birth-related factors:

The average number of births in the study sample (2.56, SD ±1.64) was lower than that of the Palestinian population (4.2 in West Bank and Gaza in 2010 and 3.8 in West Bank alone[57]. This may be due to the young age of the study sample as 92% of participating mothers were less than 34 years of age. Moreover, the fertility and average number of birth is decreasing in Palestine as it decreased from 6 in 1997 to 4.4 in 2008/2009 and 4.2 in 2010 and this is particularly noticed in the West bank, while the study was conducted in 2013[56].

The most common complications during pregnancy were nausea and vomiting (71.5%) and anemia (28.1%) followed by gestational hypertension and/or preeclampsia (7.2%) and antenatal bleeding (3.4%). Threatened abortion, preterm labor and gestational diabetes were only present in less than 2% of cases. The relationship between these

complications and the occurrence of PPD will be discussed later through this chapter.

The rate of Caesarean delivery (31.9%) is higher than the national rate (21.9%) despite low rate of pregnancy complications mentioned. Actually this practice cannot be scientifically justified and may reflect the obstetricians' choice to rush into operative delivery rather than vaginal deliveries. Mother's preference may also play a role as vaginal delivery may be considered as more painful experience[38]. Abdul-Rahim et al. reported doubling of the Caesarean delivery rate from 1996-2006 and observed associations between this increase and primiparity, older age (also primiparity and older age interaction), higher education and area of residence but these were associations rather than causative factors[58]. It can be noticed that there is a high rate of episiotomy (48.5% of total and 71.25% of vaginal deliveries). The trend of doing routine episiotomy for first birth[59] is not the only explanation as only one third of the participants are primipara. This may reflect the physicians and midwives tendency to do episiotomy early during the labor course due to fear of complicated labor and may also reflect the lack of excellent obstetrical skills. On the other hand, there is low usage of vacuum in vaginal deliveries (3.75% of vaginal deliveries), which may indicate that physicians rush into Caesarean sections rather than trying instrumental vaginal delivery one the birth is difficult.

5.1.3. Baby-related factors:

The sex distribution of the newborns in the sample is almost similar to the national one. 48.9% of the mothers gave birth to male newborn whilst 51% of deliveries in 2012 in Palestine were to female babies[57]. 16.2% of the newborns were born before the 9th months of pregnancy (preterm) and 12.8% of them were admitted to neonatal intensive care units (NICU). On the other hand, only one mother (0.4%) reported their baby to be ill, which means that most of those babies who were admitted to NICU were due to prematurity. It is also possible that mothers avoid to report illness of their newborns or they use the term "ill" for critical illnesses only as having major disability. This is supported by the fact that 0.1% of the newborns in the West Bank in 2012 had some type of disability[57].

Lastly, the participating mothers reported high rate of breast feeding as 65.1% reported exclusive breastfeeding and 28.1% reported mixed formula and breastfeeding to their infants. These numbers are double the national numbers as 29.9% of the Palestinian infants and 31.5% of Nablus infants received exclusive breastfeeding in the first 6 months of age[57]. One possible explanation is that the interview was done at about 2 months after birth and the rate of exclusive breastfeeding declines with advance in infant's age.

5.1.4. Psychological factors and mental history:

Only 4 mothers reported having a personal or family history of mental illness or depression. It is expected that the stigma and shame felt by Arab people toward mental illness prevent them from disclosing mental illness

history and even looking for professional advice in case of mental illness[60]. Cultural norms prohibits exposing such sensitive personal and family issues to outside and previous research reported that Arab people feel lack of trust in mental health service providers and have strong concerns about confidentiality of disclosing mental distress[60]. Moreover, Arab people like many other Eastern cultures tend to somatize mental distress which means that they express mental illness or distress like depression into physical complaints like headache, abdominal pain and other symptoms in order to avoid social stigma[61] and this may underestimate the reporting of mental illness in self and family.

On the other hand, 25.1% of mothers reported having depression during pregnancy. This rate seems plausible although it was not measured in a standardized manner and it was asked about retrospectively after birth as it was approximate to what have been found in many Arab countries using standardized tools. In Jordan, the prevalence of depression during the third trimester was 19% (EPDS $\geq$ 13) [17]. Glasser et al. found that the prevalence of depression during pregnancy in Palestinian Arab Mother's in Acre is 20.8% at 26 weeks of gestation (EPDS score $\geq$ 10) [39]. Another study in Sharjah, UAE reported a prevalence of moderate depression during the 3rd trimester using Beck Depression Inventory (BDI-II) of 22.6%[35].

The prevalence of psychological stressors was investigated by asking about 11 stressful life events during pregnancy. Financial difficulties rated first with a prevalence of 54.9%. We can understand this result in the light of other results as 44.3% of the participants reported having total family

income less than 2500 shekels which is around the national poverty line[56]. Moreover, 51.1% of the participants have income: family member ratio less or equal to 500 shekels which is below the average individual monthly expenditure of 800 shekels[56]. The second stressor was difficulty in dealing with children reported by 25.1% of mothers in the study. This question was for mother who have previous children as it asks about the problem during the last pregnancy.

Death of a dear person, severe illness of the mother herself or a dear person, and being away or separated from a dear person ranked almost the same with rates of 12.3%, 11.1% and 10.2% respectively. The rest of the list (housing problems, marital separation or divorce, accidents or injuries, verbal and physical abuse and conflict at work) were reported in 6% to 0.4% of the participants only. The relationship between these stressors and PPD will be discussed later in the following sections.

5.1.5. Marital and family relationships and social support factors:

Most participants reported good relationships with their husbands (94.9%) and their own families (98.7%). This rate may be inflated as Arab people avoid talking about sensitive family issues and may talk about these issues positively to avoid social criticism[60]. Nevertheless, 78.7% of the participating mothers reported good help and support from their husbands, another reflection of good marital relationship. The relationship with the mother-in-law is a critically sensitive issue among Arab women. About 80% of the participating mothers reported good relationships with their mothers-in-law. Actually, 8.9% of mothers did not answer the question

about their mother-in-law but some of them reported that their mother-in-law was dead.

Similar to reporting good family relationships, 46% and 43.4% of the mothers reported having high and moderate social support respectively. The mean score on Maternal Social Support Scale (MSSS) was 23.88 out of 30 [95% CI: 23.42 -24.34]. These high scores are understandable as Palestinian women like other Arab and Eastern women receive help and support from the whole family[27, 32, 34]. Recently delivering women – especially those giving birth for the first time- may stay at their mothers home for a month after birth and receive assistance in newborn care[34]. In fact, childbirth is highly welcomed and appreciated in the Palestinian society.

5.2. Prevalence of Postpartum Depression:

The prevalence of PPD was 17% [95% CI: 12.2% to 21.8%] and the prevalence of severe depression was 8.9% [95% CI: 5.26% to 12.54%]. This prevalence is high but lower than what was reported in many Arab and developing countries, even when taking into consideration the difference in timing and cut-off points used to define depression. The prevalence of PPD in Jordan was 22.1% (EPDS ≥ 13) [17]. The prevalence of PPD also was higher in Lebanon 21% (EPDS ≥ 12)[38], Abu Dhabi 22.1% (EPDS ≥ 13)[34] and Bahrain 37.1% (EPDS ≥ 12) [36]. This prevalence is also lower that that reported for low and lower-middle-income countries which was 19.8% [95% CI: 19.5−20.0] [16].

On the other hand, almost similar prevalence was reported in Dubai 15.8% (EPDS ≥ 12)[32], Sharjah 16.8% (EPDS ≥ 10)(35), Qatar 17.6% (EPDS ≥ 12)[37] and Palestinian Arab women in Acre 16.3% (EPDS ≥ 10) [39].

Although high, the prevalence of PPD in the study sample was less than expected taking into consideration the huge amount of stressors that are faced by the Palestinian people and Palestinian mothers in particular. These include the Israeli checkpoints and the night attacks at Palestinian homes, the violence imposed by the Israeli settlers and the imprisonment and loss of their husbands, sons, brothers and other relatives[62]. This could be attributed to many reasons which were found to be protective against postpartum depression. The participating mothers were highly educated as 43.4% achieved higher than secondary education and the mean education years were 12.6 [95% CI: 12.20-12.98] and a median education of 12 years. Higher education was reported as protective against PPD in the low and lower-middle income countries and some Arab countries[16, 37, 42]. In addition, most of the participating mothers reported enough social support and marital relationship satisfaction as discussed earlier. Social support is one of the major determinants of postpartum depression and those mothers who have higher social support are at lower risk of PPD[2, 23].

Other factors include the use of personal interview instead of self-administered questionnaire for investigating postpartum depression. The use of interviews resulted in lower prevalence of PPD rather than self-administered questionnaires in meta-analysis reviews[2, 16]. The association

between PPD and other studied factors will be discussed in the following sections.

5.3. Factors associated with PPD:

5.3.1. Socio-demographic Characteristics:

None of the investigated socio-demographic variables was associated with PPD according to Chi square analysis. The variables are age, residence, education, occupation, total family income and income to family member ratio, and the presence of health insurance. These results support the accumulating evidence which states that PPD is mostly precipitated by psychosocial factors[2, 16, 23, 28]. The PPD studies in the Arab countries showed non-conclusive evidence, as some factors have significant association with PPD and others showed no association with the same factors[31].

Low income and socioeconomic status were associated with PPD in many Arab and low income countries[16, 37, 42, 43] Although half of the participating mothers reported income less than poverty line, chi square analysis showed no association between the level of income and PPD in Palestinian mothers. Nonetheless, financial difficulties were significantly higher among severely depressed mothers (EPDS $\geq$ 13). Other Arab studies, including the study of Palestinian Arab mothers in Acre showed no association between PPD and income[34, 35, 39]. In addition, O'hara and Swain reported mild association between PPD and low income in their meta-analysis about prevalence and risk factors in Western countries[2], whereas other meta-analysis done by Beck found mild association between

PPD and low socio-economic status[23]. This may be due to Palestinian people coping with the poor financial situation over decades, as many of the participating mothers (25.1%) for example reported facing financial difficulties during pregnancy but there was no significant association between this and the occurrence of PPD.

5.3.2. Pregnancy and Birth-related Factors:

None of the pregnancy and birth-related variables was significantly associated with postpartum depression in this study.

The variables include pregnancy complications (gestational hypertension or preeclampsia, gestational diabetes, antenatal bleeding, threatened abortion, vomiting and dizziness, and anemia) and the presence of chronic medical illness. This may be due to low number of mothers having obstetrical complications in this study (see table 4.7). 4 Arab studies reported positive association between obstetrical complications or presence of medical illness and PPD[37, 38, 40, 41], whilst one reported no association[43]. Similarly, O'hara and Swain, and Fisher et al. reported mild association between these factors and PPD[2, 16], whilst other reviews like Beck's review showed no association[23].

Except for anemia and nausea or vomiting, the percentage of participating mothers having other obstetrical complications (gestational hypertension or preeclampsia, gestational diabetes, antenatal bleeding, threatened abortion) did not exceed 6% and even none of the depressed mothers had gestational diabetes and antenatal bleeding and only one mother experienced one of the other complications. Similarly, only 5% of the sample had a chronic

medical illness. It is important to notice that anemia were more prevalent among depressed mothers with p-value of 0.066 which means that it may has a significant association with PPD if the sample size was larger. The direction of relationship between anemia and PPD cannot be determined here, but an association between anemia and PPD was found in a recent Iranian study that reported higher PPD rate (OR 4.64; 95% CI: 1.33-16.08) among mothers who had a haemoglobin less than 11 g/dL at delivery[63].

This study also found no association between PPD and birth-related variables (the place of birth, the route of birth whether vaginal or Caesarean Section (CS), the use of vacuum or episiotomy, and the satisfaction with medical care during birth).

Six Arab studies investigated the effect of route of birth on PPD. While 4 studies reported no difference in PPD rate and the route of birth, Bener et al. reported higher PPD rate (OR =1.4, 95% CI: 1.04-1.87) among mothers delivering by Caesarean section[37]. Chaaya et al. reported significant association between PPD and the product of interaction between the route of delivery and residence[38]. Having CS delivery was associated with higher PPD rates among Lebanese Bekaa villagers, whereas PPD rate was significantly higher among urban Beirut mothers who deliver vaginally[38]. This point is very important in understanding the psychological background of PPD as urban Lebanese mothers perceived vaginal birth as more painful and traumatic experience whereas rural mothers preferred vaginal birth because they considered the need for CS operative delivery as a complication of pregnancy and birth which they prefer to avoid[38]. This

means that it is the traumatic or painful experience of birth that lead to more depression rather than the route of birth itself. A Jordanian study by Oweis investigated the relationship between PPD among primipara, vaginally delivering mothers and birth experience and reported significant positive correlations between PPD and perceived difficulty of labor and perceived stress of childbirth ($r= 0.36$ and 0.53 respectively; $p < 0.001$) [18]. Moreover, Mohammad et al. from Jordan investigated the relationship between PPD and births factors in details[17]. Chi square analysis showed that PPD was associated with longer labor duration, higher number of vaginal examinations, having episiotomy or requiring sutures, and having more than expected pain during labor, but none remained after logistic regression analysis[17].

Whilst episiotomy was performed in almost half of mothers and was not associated with PPD in this study, vacuum assisted delivery was used in only 6 mothers (2.5%) and the p value of PPD association with vacuum use was 0.06, which is also not significant but may be so if the sample is larger or vacuum was used more frequent. Again, this may be explained by the trauma and pain perception caused by vacuum assisted delivery. This is not the case with episiotomy as the high rate of performing episiotomy among mothers may make it perceived as a normal routine step of vaginal birth.

Another method of assessing mothers' perception of birth experience is the level of satisfaction with care provided during birth. On a scale of 5, ranging from poor (= 1/5) to excellent (= 5/5), the mean satisfaction with medical care during birth was 3.67 [95% CI: 3.52- 3.82] and the median

satisfaction was 4. Chi square analysis for trends showed no significant statistical difference in PPD rate among categories of satisfaction. Further grouping of satisfaction categories into poor (poor and satisfactory, 1-2/5), and good (good, very good and excellent, 3-5/5) showed no association again between satisfaction with birth care and PPD rate. These results may be due to the high rate of satisfaction with birth care as 86% of participating mothers reported receiving good care during birth. This in turn may add to the explanation of why PPD was not associated with CS delivery or episiotomy use, as mother's satisfaction with birth experience may be a proxy indicator of less painful and traumatic perception of birth and thus lesser rate of PPD. Mother's dissatisfaction with Intrapartum care was significantly associated with PPD in the study conducted by Mohammad et al. among Jordanian mothers[17]. Detailed elements of satisfaction including dissatisfaction with pain relief in labor, being not informed or taking labor-related decisions without discussion with the mother or considering her opinion, feeling pressured to deliver quickly and feeling that health-care staff was unhelpful or offensive were all associated with higher PPD symptoms in chi square analysis, but only feeling pressured for quick delivery remained in logistic regression analysis[17]. Moreover, Oweis found that mothers who perceived less nursing support during birth were at higher risk of PPD ($r= -0.31$; $p < 0.001$)[18]. Further analysis by multiple regression analysis showed that only perceived stress of childbirth remained a significant predictor of PPD[18], a finding that can explain why birth variables were not associated with PPD in this study as

most mothers reported good satisfaction with birth a proxy of birth related stress.

Lastly, unwanted pregnancy showed no statistically significant difference between depressed and non-depressed mothers. Actually, the association between planning or wanting the pregnancy and PPD is controversial among literature. Beck and Fisher et al. reported unwanted/ unplanned pregnancy as mild predictor of PPD in Developed and low income countries respectively [16, 23], whilst other review of PPD risk factors in Asia and Africa showed mixed pattern of evidence[27, 28]. Similarly, some Arab studies reported that mother's who did no plan or want to be pregnant were higher to report PPD [17, 32, 42], whilst other larger sample studies showed no significant association between them[36-38, 40].

In conclusion, pregnancy and birth-related factors were not associated with occurrence of PPD in this study. Reviewed literature about PPD risk factors showed mixed pattern of evidence about this association with evidence that the more stress and anxiety caused by the pregnancy and birth complications, the more the risk of PPD.

5.3.3. Baby Factors:

None of the investigated baby-related factors showed statistically significant relationship with PPD except newborn prematurity. Against expected, mothers who delivered premature babies had lower rates of postpartum depression [OR = 0.23, 95% CI: 0.05-1.0, p 0.035]. This may be due to non-clear definition of prematurity in this study. To define prematurity, mothers were asked if they delivered before the start of 9th

month of their pregnancy and this may be not reliable. Medically speaking, the newborn is premature or preterm is he/ she was born before completing 37 weeks of gestation[64] which is different from dating pregnancy by months. Moreover, estimation of the gestation age and birth due date are most of the time based on low reliability methods and are prone to errors that may add or remove at least one week. Lastly, regression analysis showed that having a premature baby is not a significant predictor of PPD which may raise the possibility that it was significant by chance alone.

Although 16.2% of mothers reported that their babies were admitted to a neonatal intensive care unit (NICU) after birth, this was not associated with higher rates of depression. Newborns are often admitted to nursery for few hours soon after birth for observation then discharged, and some mothers may not differentiate this from the actual need of admission for intensive care unit. On the other hand, only one mother reported her son as being ill, as mothers may only consider the baby ill if he has a critical illness.

Although having a female baby is a risk factor for PPD in some Arab[17] and developing countries[16], this was not associated with PPD in this study. Actually, female babies predisposed to PPD in Jordan[17, 18], but not in Qatar[37], Bahrain[36] or Morocco[40], despite the fact that all these communities show male predominance. When asking participating mothers about the preferred sex of their newborn, 47.2% answered that they have no difference, 28.5% wanted a male and 24.3% wanted a female baby. This may be due to the fact that Palestinian people in general and women in particular are highly educated and Palestine has the highest women

education rate in the Arab World[62]. Moreover, Palestinian women were involved throughout the recent history in the political struggle and resistance against Israeli occupation and enjoyed deep respect in the Palestinian society despite male predominance, and they are involved in daily affairs, work and education[62, 65]. In addition, the Islamic religious point of view calls for equity between males and females and supports girl education[65]. Lastly, we can notice that 78.3% of the participating mothers gave birth to a baby of the desired sex or reported no difference regarding the wanted baby sex, which may decrease the effect of baby sex on the depression state as most mothers were satisfied with the sex of their new baby.

Breast feeding was associated with lower rates of PPD in many studies in the developing countries[16, 27]. Four Arab studies reported that women who breastfed their children were less to experience PPD than those using milk formulas[34, 35, 37, 38]. On the other hand, 3 studies reported no association between PPD and the type of feeding[36, 40, 41]. Actually, the relationship between breastfeeding and PPD is bidirectional, that is, depressed mothers are less often to breastfeed their infants as PPD interfere with the maternal role, and breastfeeding women are somehow protected against PPD compared to their non-breastfeeding counterparts[66].

5.3.4. Psychological factors and mental history:

As the case in most PPD studies and systematic reviews, depression during pregnancy and previous personal history of depression or mental illness is one of the most powerful predictors of PPD[2, 16, 23]. In this study both

variables were significantly associated with the presence of PPD, whilst having a family history of depression or mental illness was not associated with PPD occurrence. It is important to notice that only 4 mothers reported positive personal or family history of mental illness as this is an avoidable sensitive issue in the Palestinian society as discussed earlier. Nevertheless, 59 (25.1%) of mothers reported experiencing depression during pregnancy and this was strongly associated with PPD. This may be due to the wording of the question as the question about antenatal depression was "Have you suffered from depression during the last pregnancy?" while the questions about personal and family history were "Have you ever suffered or a physician told you that you have a mental or psychological illness?" and "Has any of your family members ever suffered from a mental or psychological illness?". The use of words "mental illness" and "psychological illness" may be more stigmatic than the word "depression" which may reflect feelings and emotional status rather than being an illness. Secrecy in response to stigma prevents patients from admitting having depression and even prevent physicians in many circumstances form asking about it[67].

History of depression during pregnancy was associated with PPD in 4 Arab studies, and those with depression during pregnancy were at 3-14 times higher risk of PPD[17, 35, 36, 38]. Four Arab studies also reported significant association between personal history of depression and PPD[32, 36, 38, 43] and one reported significant relationship between family history of depression or mental illness and PPD[36]. On the other hand, a large Qatari study

reported no significant association between PPD and personal or family history of mental illness but it did not investigate the relationship between PPD and depression during pregnancy[37]. These findings may support the theories of psychosocial origin of PPD as those mothers who had previous depression either during pregnancy or before have special characteristics - including genetic predisposition [12] and lower threshold of tolerating stressful events [68]- that predispose them to PPD more than their counterparts without history of depression.

The higher number of stressful life events experienced by the mother, the higher the rate of PPD she will have. O'hara and Swain, and Beck reported stressful life events as moderate to strong predictor of PPD[2, 23]. Three Arab studies reported positive association between stressful life events during pregnancy and the occurrence of PPD[32, 38, 40]. These studies used both standardized tools and regular questions to assess life events. On the other hand, an Emirati study by Hamdan and Tamim found the association between PPD and stressful life events not significant[35]. These differences may be due to differences in stressful events been investigated. For example, in this study, PPD was significantly associated with being away from a dear person, exposure to verbal harassment, hitting and physical abuse, marital separation or divorce, severe illness of the mother or a dear person and difficulties dealing with children, whereas it has no significant association with problems or conflict at work (only for employed mothers and only one mother reported this problem), housing problems, financial difficulties, accidents or injuries and death of a dear person. In addition to

the nature of the stressful event, the more the events experienced, the higher the rate of PPD, as more stressful events means more stress and anxiety during pregnancy which are known risk factors of PPD[2, 17, 23].

5.3.5. Marital and family relationships factors:

Family and husband support play an essential role in helping mothers avoiding and coping with PPD[16, 51]. On the contrary, the lack of husband's and family support is one the well established predictors of PPD[2, 16, 23].

Although most of the participating mothers reported good relationships with their husbands, families and mothers-in-law, poor perceived relationships with the husband and mother-in-law were significantly associated with occurrence of PPD. Also poor perceived husband's help and support was significantly associated with PPD.

The supportive husband is the first barrier against depression as he is the most intimate person the mother trusts and feels relaxed with[69]. The presence of marital conflict and relationship non-satisfaction hinders the fulfillment of this supportive role and thus deprives the mother of one of the most important defenses against PPD. Poor marital relationships were significant moderate predictors of PPD in both developed and developing countries[16, 23]. PPD was also significantly higher among single mothers, a proxy indication of the association between PPD and absence of husband's support[16, 23]. Most Arab studies reported a significant relationship between PPD and poor marital relationship or marital conflict[17, 32, 37, 40, 43], and poor husband help and support[36, 41]. Four Arab studies investigated the

association between PPD and polygamous marriage[32, 34-36], and only one found a significant relationship between them[32].

In addition to husband's support, the family support plays a great role like the husband especially in the Asian, African and Arab countries were the role of the extended family is powerful and the mother's own mother and her husband's mother have significant role after birth[27, 34]. Arab countries like other Asian and African countries have many traditions and customs practiced in the period after birth[27, 28, 34]. The mother in the Palestinian society like other Arab countries stays at the house of her own mother soon after birth for a month and receives help in caring for herself and her baby from her mother and sisters[34]. Sometimes, the mother stays at her own house but her mother or mother-in-law move to her house to help her[34]. This help is not good all the time as mothers and mothers-in-law tend to dictate their own opinions regarding the mother and her baby and this may lead to a conflict which increases the stress and depression of the mother[27, 34]. Often, this conflict is exacerbated if the relationship is already poor.

This study found a statistically significant association between PPD and poor relationship with mother-in-law despite that 9% of participating mothers did not answer this question. Three Arab studies showed similar results[17, 34, 37]. Moreover, systematic reviews of the low income countries and Asian countries reported significant relationship between PPD and poor mother-in-law relationship[16, 27]. On the other hand, none of the reviewed literature in Western countries investigated or reported this

relationship as these societies are composed of smaller nuclear families where the effect of other relatives are small.

The poor relationship with the mother's own family was not significantly associated with PPD. This may be due to the fact that only 3 mothers (1.2%) of the participants reported poor relationship with their own families. However, Green and Al-Dallal found no relationship between PPD and poor relationship with the mother and poor mother's help respectively[34, 36].

Some studies investigated the maternal social support as a more comprehensive predictor of PPD rather than taking single items separately. Webster et al. created the six-item standardized maternal social support scale (MSSS) and tested it as a predictor of PPD[51]. This scale was validated in Arabic and tested by Mohammad et al. and it was significantly associated with higher PPD rates[17]. Unsurprisingly, PPD was significantly associated with low perceived social support on MSSS in this study. This result is supported by similar findings from Jordan[17], Lebanon[38] and Qatar[37]. Poor social support was a moderate to strong predictor of PPD in the systematic reviews done in developed countries[2], and developing low income countries[16]. Fisher et al. reported that depressed mothers were 1.6-8.8 more times to report poor social support than non-depressed mothers in the low in lower-middle income countries.

The results of this study were similar to other studies regarding the negative effect of poor social support on PPD.

5.4. Predictors of PPD by logistic regression:

Multivariate analysis, especially logistic regression has been used widely in health studies to figure out the relation between the predictor variables and

the outcome[70]. Logistic regression is used specifically when the outcome variable is dichotomous (i.e. depressed or non-depressed) [70]. In order to come with a good logistic regression model, the ratio of cases or events to the number of predictor variables which is also known as event per independent variable (EPV) should be equal or more than 10[71, 72]. Ratios less than 10 produce bias in regression coefficients by increasing them to extreme values, thus making bias about the prediction ability of these variables[71]. Unfortunately, in this study the EPV was 4.78 (39 events or depressed mothers divided by 8 significantly associated variables), which may produce a biased model of regression. Nevertheless, Logistic regression was done in order to decrease the effect of confounding variables and to figure out the most significant predictors of PPD.

Depression during pregnancy is the most important predictor of PPD with those mothers PPD are 11 times more likely to be depressed during pregnancy, [OR =11.2, 95% CI: 3.79- 33.19, $p < 0.001$]. This result is the same as that reported by O'hara and Swain, Beck and Fisher in their systematic reviews[2, 16, 23]. In addition, four Arab studies in Jordan[17], Lebanon[38], UAE [35] and Bahrain[36] found that antepartum depression is one of the most significant predictors of PPD. Mothers suffering from depression during pregnancy may continue to have it after birth, and the psychosocial stressors that caused depression before birth may still persist to cause it after birth.

Unexpectedly giving birth to a male baby as depressed mothers were 0.17 time likely to give birth to a female baby, [OR= 0.29, 95% CI: 0.089- 0.85,

p 0.024]. As mentioned earlier, systematic reviews of Western studies showed that PPD is not associated with baby gender[2, 23]. Other systematic reviews from low and lower income countries[16] and Asian countries[27] reported that PPD was associated with giving birth to a female baby. Mohammad et. al. reported similar relationship in the Jordanian people[17], but other Arab studies in Morocco[40], Qatar[37] and Bahrain[36] reported no association between PPD and baby's gender. Further analysis was done by chi square test between baby sex, desired baby sex, and agreement between desired and actual baby sex on one hand and the presence of depression during pregnancy, number of stressful life events, satisfaction with marital relationship, family relationships and mother-in-law relationships, and perceived social support and no significant difference was observed. Moreover, the numbers of female and male babies in the study are almost the same, and the number of mothers preferring males or females are also almost the same.

A thorough search of the literature was done for studies with a similar conclusion and a single French study was found to report that having a boy baby negatively affected the mothers quality of life and was associated with higher PPD[73]. The authors hypothesized two possible explanations. The first is the contemporary psychoanalysis theory which states that humans are nowadays constructing their personalities into narcissistic rather than oedipal model in their relationships (i.e. attraction to same sex rather than the opposite sex), thus mothers may prefer babies of the same sex[73]. The second hypothesis is based upon few reports in which male babies are

considered difficult to sooth and have worse temperament than female babies[73], however our study found no significant difference in reported difficulty in dealing with children between mothers who have male and those who have female babies. Indeed, further research including qualitative research is needed to figure out the reality of this relationship or it was just found significant by chance alone.

It is also worthy to notice that poor satisfaction with marital relationship [OR =5.44, 95% CI: 0.87- 34.16, p 0.071] and low social support [OR=2.43, 95% CI: 0.91- 6.49, p 0.078] has moderately predicted PPD despite being statistically non significant, so they may have a bigger role if the sample size is larger. O'hara and Swain concluded that poor marital satisfaction is a predictor of PPD the developed countries[2], whereas Fisher reported the same result in the developed countries[16]. Six Arab studies concluded the same result in UAE[32], Jordan[17], Morocco[40, 41], Qatar[37] and Tunisia[43]. Husband or partner is the key supporter of the mother especially in the critical stressed times of birth and postpartum, and the loss of this value predispose the mother to depression. Also low social support is one of the most important predictors of PPD in many international and Arab studies[17, 23, 37, 38, 43]. The absence of a social support from the husband, the family and the surrounding when exposed to stressful times like pregnancy and birth may negatively affect the coping process and thus causing depression.

5.5. Limitations of the study:

Although this study is the first to investigate the prevalence and associated factors with postpartum depression in Palestine, it is not -like all studies-

without limitations. Most of the limitations are in the methodology of the study as the sample was convenient rather than random, which may result in selection bias by excluding some of the clinics in the Nablus district, but this approach was necessary in the light of limited resources. Moreover, the sample size is not large enough to figure out factors associated with PPD with enough statistical power although it is enough for figuring out prevalence with good precision. Nonetheless, we tried our best to recruit the participating mothers from different clinics of Nablus district including city, village and camp clinics. The resulting sample characteristics were almost similar to the study population in many aspects as discussed earlier. In fact, many of the published studies used convenient sampling and even less sample sizes due to logistic issues[32, 34, 40-43]. Moreover, this study is an exploratory study and the authors faced many logistic and financial difficulties during conduction including the need for transportation and the small number of mothers in village clinics, the lack of financial support to pay for full time interviewers and the short period of time due to cope with master degree time limitations.

The study asked about risk factors during pregnancy retrospectively as time and resource limitations prevented the conduction of the study during pregnancy with follow up till 2 months postpartum. The retrospective approach may be less accurate due to recall bias as mothers may forget details and experiences occurred during pregnancy.

Edinburgh Postnatal Depression Scale (EPDS) is a screening rather than diagnostic tool and it may not reflect accurate prevalence rate as diagnostic

tools which may result in measurement bias and inflate the rate of depressed mothers. Nevertheless, EPDS highly predicted PPD and its results were associated with diagnostic tools in many studies[32, 54, 74]. Moreover, 2 Arab studies used EPDS with Mini International Neuropsychiatric Interview (MINI) diagnostic tools and the results of PPD prevalence in both MINI and EPDS (cut off ≥ 12) were almost similar at the same point of time[35, 40].

This study investigated the association between PPD and many factors including: socio-demographic factors, pregnancy, birth, and infant-related factors and psychosocial factors but it did not assess the role of other factors like biological factors including hormonal and nutritional factors. In fact, although biological factors may have a role in pathogenesis of PPD, they only work when the mother is genetically and psychosocially predisposed to depression[12]. Moreover, the study of these factors needs costly laboratory support which is beyond the objectives and the affordability of this study.

Lastly, the use of logistic regression analysis was implausible as some of the significant associated variables in univariate analysis have a very small number of cases compared to non-cases, which will result in extremely high odds ratio of association as discussed earlier. In fact, many of the variable tests in univariate testing might be significant by chance due to multiple comparisons on a relatively small sample when compared to the power needed to figure out the PPD associated factors. This point has been discussed by many researchers and statisticians. For example, Bland and

Altman suggested that the corrected P value- which is the probability of rejecting null hypothesis and having a statistically significant test- to be equal to (α/k), where k is the number of tests being performed or variables being compared, a procedure called Bonferroni correction method[75]. Other methods are used[76, 77] but all agree on that multiple testing may result in statistically significant results by chance alone and the higher the number of tests done the lower the actual P value and the significance of the test are. Hence the use of logistic regression was necessary to minimize the effect of confounders and to conclude the most significant predictors of PPD.

5.6. Conclusion and Recommendations:

This study is the first study about postpartum depression prevalence and associated factors in Palestine, in which EPDS was used to assess PPD prevalence at 2 months after birth among mothers aging 18-45 years throughout Nablus district. The prevalence of PPD was 17% (EPDS cut off ≥ 10) whereas prevalence of severe PPD (EPDS ≥ 13) was 9%.

The factors that were significantly associated with PPD were: depression during pregnancy, two or more stressful life events during pregnancy, low perceived maternal social support, poor perceived marital relationship, poor perceived husband's help and support, positive personal history of depression or mental illness, poor perceived relationship with the mother-in-law and premature newborn.

These findings show that PPD is highly prevalent among Palestinian mothers and it is associated with different psychosocial stressors and

problems. Thus PPD needs urgent efforts from health care professionals and health decision makers in order to screen for and early identify this highly prevalent, high burden, preventable condition and then to apply measures in order to decrease its effects on mothers, babies and the entire family.

We recommend to integrate PPD screening in the routine package of services during antenatal and postnatal care. Using EPDS for this purpose may be effective as it takes very short time and it is proved to be effective in identifying mothers at higher risk of PPD. Screening may also be conducted on community basis and after birth home visits by community health workers to reach more women who may be in more need for identification and intervention.

Moreover, we recommend to increase awareness and knowledge of both mothers and health-care workers regarding this problem as the interviewing nurses noticed lack of appropriate knowledge about PPD among both mother and maternal and child health nurses. Lastly, we recommend further research to be conducted in this area, including follow up studies with larger samples to figure out risk factors of PPD, studies about appropriate prevention and treatment measures of PPD among Palestinian mothers and qualitative research for more understanding of mothers feeling and experiences during pregnancy and postpartum period.

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Annexes

Annex 1A:

List of MCH and PHC clinics offering vaccination services in Nablus district and the average number of newborns registered and vaccinated with the 1st day vaccine monthly.

Clinic		average no. of newborn registered & vaccinated monthly	Clinic		average no. of newborn registered & vaccinated monthly
Nablus villages = 300			**South-Western Villages = 118**		
North-Western Villages = 78			**Hiwara**	حوارة	**10**
Bizzarya	بزاريا	**6**	**Einabos**	عينابوس	**3**
Burqa	برقة	**4**	**Beita**	بيتا	**21**
Talloza	طلوزة	**4**	**Jimaein**	جماعين	**17**
Yasid	ياصيد	**4**	**Orif**	عوريف	**7**
Beit Emrin	بيت امرين	**5**	**Burin**	بورين	**13**
Sabastia	سبسطية	**7**	**Yetma**	يتما	**5**
Al-Naqora	الناقورة	**1**	**Qabalan**	قبلان	**10**
Deir Sharaf	دير شرف	**6**	**Qusra**	قصرة	**11**
Asira al Shamalia	عصيرة الشمالية	**13**	**Talfit**	تلفيت	**8**
Qusin	قوصين	**4**	**Al-Sawya**	الساوية	**4**
Beit Eiba	بيت ايبا	**5**	**Qaryot**	قريوت	**5**
Sarra	صرة	**5**	**Doma**	دوما	**4**
Tel	تل	**10**	**Nablus camps = 131**		
South-Eastern Villages = 140			**Balata camp**	مخيم بلاطة	**60**
Al-Nassariya	النصارية	**3**	**Askar camp**	مخيم عسكر	**36**
Azmot	عزموط	**5**	**New Askar camp**	مخيم عسكر الجديد	**12**
Deir al Hatab	دير الحطب	**5**	**Al- Ein camp**	مخيم العين	**23**
Beit Dajan	بيت دجن	**4**	**Al-Nassariya clinic**	عيادة النصارية	**7**
Rujeeb	روجيب	**11**	**Nablus city = 175**		
Aqraba	عقربا	**18**	**Al- Makhfiya**	المخفية	**35**
Balata	بلاطة	**35**	**Al-Markaziya**	المركزية	**100**
Al-Bathan	الباذان	**4**	**Ras el Ein**	راس العين	**28**
Beit Forik	بيت فوريك	**24**	**Al- Balda al-Qadima**	البلدة القديمة	**12**
Awrta	عورتا	**10**			
Majdal Bani Fadel	مجدل بني فاضل	**3**			
Vaccination outreach team	فريق التطعيم للبدو والقرى النائية	**18**			

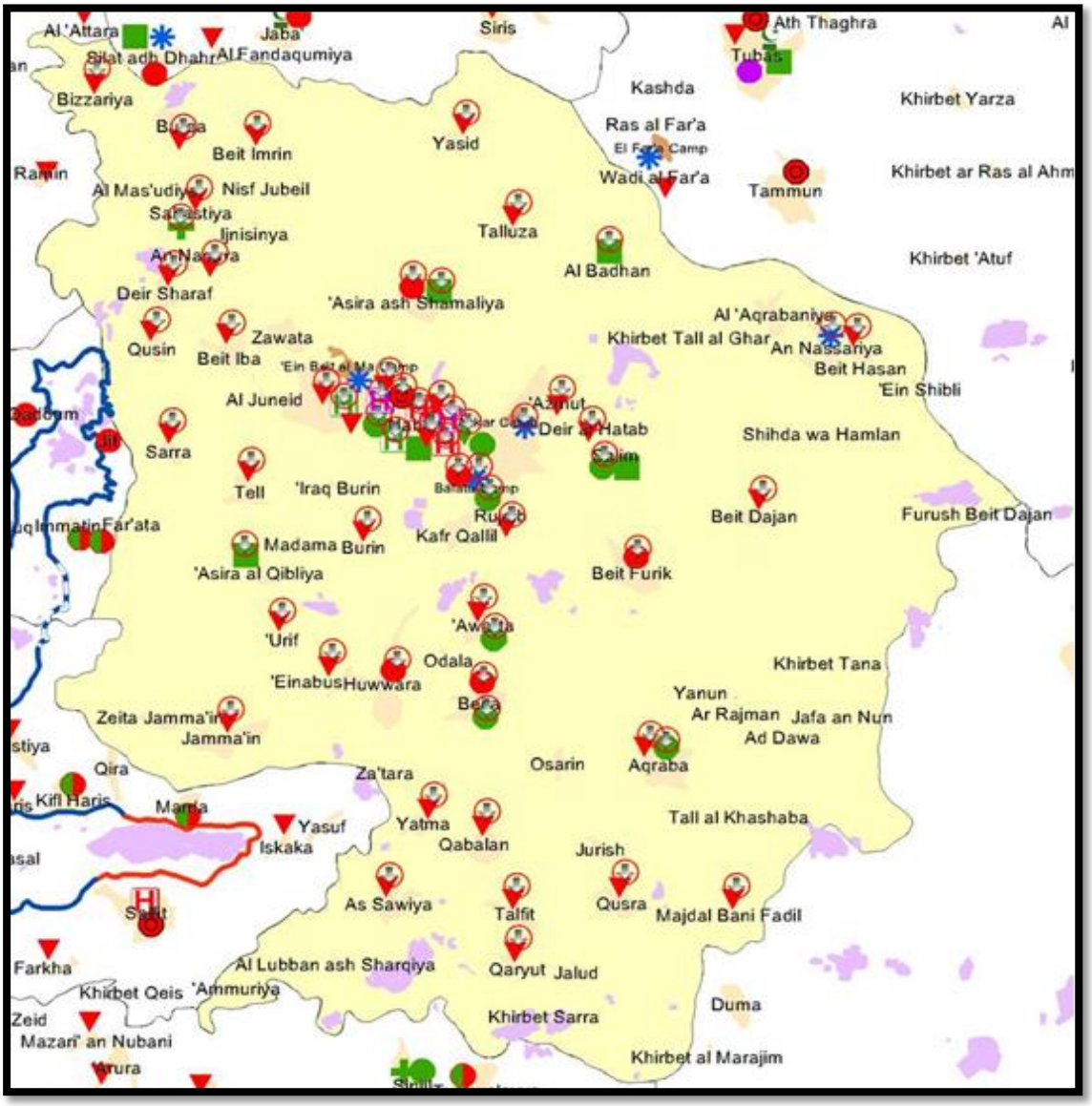
Annex 1B:

A map for Nablus city showing geographical classification of vaccination clinics

This map is modified from the Palestinian National Committee for the Register of Damage of the Wall

(PNCRoD) website. The original map is available at: www.pncrod.ps/nablus.jpg accessed on 27/3/2013.

Annex 1C:



A map for health facilities in Nablus district
Adapted from the Palestinian Ministry of Health website: http://www.moh.ps/?page=10&cid=2 accessed at 28/2/2013

Annex 2: Arabic study tool

استمارة حول انتشار اكتئاب ما بعد الولادة للنساء في محافظة نابلس والعوامل المرتبطة به

عزيزتي الأم..

تعتبر ولادة طفل جديد عند الأم والعائلة من أجمل اللحظات في الحياة، لكن هذه الولادة قد تكون مصحوبة ببعض المنغصات، خاصة مع وجود تغير سريع في هرمونات الأم والحاجة للقيام بكثير من الواجبات بخصوص الطفل الجديد والمنزل، كما أن الأم قد تتعرض لتقلبات في المزاج قد تصل إلى حد الاكتئاب مما يؤثر على وظيفة الأم وتصرفاتها تجاه نفسها وبيتها وطفلها الجديد.

هذه الاستمارة هي بحث يقوم به الباحث د. خبيب أيوب من قسم الصحة العامة في جامعة النجاح الوطنية، لمعرفة مدى انتشار اكتئاب ما بعد الولادة والعوامل المرتبطة به في محافظة نابلس، حيث أن معرفة مدى انتشار هذا النوع من الاكتئاب والعوامل المؤدية له ستقود إلى فهم اعمق للمشكلة، والبحث عن حلول إيجابية لها تؤثر في صحة الأم ونفسيتها وكذلك صحة ونفسية من حولها ومن تحبهم.

<u>علماً ان جميع المعلومات المستخدمة في هذه الدراسة تحظى بالسرية والخصوصية ولن يتم استعمالها إلا في أغراض البحث العلمي فقط.</u>

إقـــــــــــــــــرار

أنا الموقعة ادناه _____ اطلعت على أهداف هذه الدراسة واهميتها، وأوافق بحرية تامة على المشاركة فيها، وإعطاء المعلومات الصحيحة خدمة للبحث العلمي.

التوقيع:_____

القسم الاول: المعلومات الديمغرافية

A.

.1	**العمر**		**تاريخ ميلادك:**	
.2	**كم كان عمرك عند الزواج**			
.3	**الاقامة**	**1. مدينة**	**2. قرية**	**3. مخيم**
	مكان الاقامة			
.4	**سنوات التعليم**	**(آخر صف درسته أو آخر سنة جامعية درستها)**		
.5	**العمل**	**1. ربة منزل**	**2. موظفة**	**3. غير ذلك**
	حددي نوع العمل			
.6	**دخل الاسرة الشهري**	**(مجموع دخل العاملين في نفس البيت)**		
		عدد الافراد الذين يستفيدون من هذا الدخل		
		كم منهم تحت سن 18		
.7	**هل تمتلكين تأمين صحي وما نوعه؟ (إذا كنت تمتلكين أكثر من تأمين ضعي دائرة على كل الأنواع)**			
	1. حكومي	**2. خدمات عسكرية**	**3. وكالة**	**4. خاص**	**5. لا يوجد تأمين**
.8	**هل تمتلك أسرتك بطاقة شؤون اجتماعية؟**			
	1. نعم، من وزارة الشؤون الاجتماعية	**2. نعم من شؤون وكالة الغوث**	**3. لا تمتلك**	

القسم الثاني: العوامل المرتبطة بالحمل والولادة:

B.

.1	تاريخ الأحمال والولادات	

1.1.	كم عدد الأحمال التي حملت بها بما فيها الحمل الأخير (كم مرة حملت)		
1.2.	كم عدد الولادات بما فيها الولادة الأخيرة؟		
1.3.	كم عدد الإجهاضات (التنزيل) أو الولادات لطفل ميت إن وجدت؟		
1.4.	كم عدد الأطفال الأحياء عندك؟		

2.	خلال الحمل الأخير الذ وضعت فيه مولودك الحالي				
	حدث معي المشاكل التالية المرتبطة بالحمل (ضعي x بعد ما يناسب)			طلق أو ولادة مبكرة	
	ضغط حمل أو تسمم حمل		نزيف أثناء الحمل	تقيؤ ودوخة شديدين	
	سكري حمل		إجهاض مهدد	فقر او ضعف دم	

3.	أين تمت ولادتك الأخيرة؟				
	1. مستشفى حكومي	2. مستشفى خاص	3. مستشفى الوكالة	4. غير ذلك (حددي	)
4.	ما هو نوع الولادة الأخيرة عندك؟				
	1. ولادة طبيعية	2. عملية قيصرية			
5.	هل تم استعمال جهاز شفط المولود			1. نعم	2. لا
6.	هل تم عمل جرح وخياطة لمنطقة الولادة؟			1. نعم	2. لا
7.	هل كنت ترغبين في حدوث الحمل الأخير؟			1. نعم	2. لا
8.	كيف تقيمين رضاك عن الخدمة الطبية المقدمة لك أثناء عملية الولادة؟				
	1. سيء	2. مقبول	3. جيد	4. جيد جدا	5. ممتاز

9.	بشكل عام هل تعانين من أية أمراض مزمنة: (ضعي x أمام المرض إن وجد)			
	ارتفاع ضغط الدم		السكري	الأزمة أو الربو
	أمراض في القلب		روماتيزم	مرض آخر (حددي)

القسم الثالث: العوامل المرتبطة بالمولود الجديد:

C.

	هذه الأسئلة تتعلق بمولودك الأخير			
1.	ما هو جنس مولودك الأخير؟	1. ذكر	2. أنثى	
2.	هل كنت ترغبين بولادة طفل	1. ذكر	2. أنثى	3. لا فرق عندي
3.	هل يعاني طفلك الجديد من اية امراض	1. نعم	2. لا	
4.	هل تم إدخال الطفل بعد الولادة إلى العناية المكثفة أو وحدة الأطفال الخدج	1. نعم	2. لا	
5.	هل تمت ولادة الطفل قبل الشهر التاسع	1. نعم	2. لا	
6.	ما طبيعة التغذية التي يتلقاها طفلك الأخير؟			
	1. رضاعة طبيعية	2. حليب صناعي	3. رضاعة طبيعية مع حليب صناعي	

القسم الرابع: العوامل العائلية والزوجية:

D.

1.	ما هو تقييمك لحياتك الزوجية وعلاقتك بزوجك؟				
	1. سيئة جدا	2. سيئة	3. مقبولة	4. جيدة	5. جيدة جدا
2.	ما هو تقييمك للدعم والمساعدة التي يقدمها زوجك لك؟				

	1. سيئة جدا	2. سيئة	3. مقبولة	4. جيدة	5. جيدة جدا
3.	ما هو تقييمك لعلاقتك مع عائلتك (ابوك وأمك واخوتك وأخواتك)؟				
	1. سيئة جدا	2. سيئة	3. مقبولة	4. جيدة	5. جيدة جدا
4.	ما هو تقييمك لعلاقتك مع والدة زوجك (حماتك)؟				
	1. سيئة جدا	2. سيئة	3. مقبولة	4. جيدة	5. جيدة جدا
5.	ما هو تقييمك لعلاقتك مع أهل زوجك بشكل عام؟				
	1. سيئة جدا	2. سيئة	3. مقبولة	4. جيدة	5. جيدة جدا

6. مقياس الدعم الاجتماعي للأم:

في كل من الجمل التالية ضعي إشارة x في المربع الملائم الذي يبين مدى الدعم الذي تشعرين الآن

		دائما	معظم الأوقات	في بعض الاوقات	نادرا	لم يحدث ابدا
أ	عندي أصدقاء جيدين يدعمونني					
ب	أجد عائلتي حين أحتاجها					
ج	زوجي يساعدني كثيرا					
د	هناك أزمة بيني وبين زوجي					
هـ	أشعر أن زوجي يسيطر علي					
و	أشعر أن زوجي يحبني					

القسم الخامس: الضغوطات النفسية والتاريخ النفسي

E.

1.	هل سبق أن عانيت أو أخبرك الطبيب أنك تعانين من أية أمراض نفسية أو عصبية؟		
	1. نعم	2. لا	3. لا أعرف
2.	هل سبق أن عانى أحد أفراد عائلتك من أية أمراض نفسية أو عصبية؟		
	1. نعم	2. لا	3. لا أعرف
3.	هل عانيت من الاكتئاب خلال الحمل الأخير؟		
	1. نعم	2. لا	3. لا أعرف

4. خلال العام الماضي أو خلال فترة الحمل، هل تعرضت لأي من هذه الضغوطات النفسية (ضعي x أمام الأمر إن وجد)

	الابتعاد عن شخص عزيز		مشاكل في السكن/ تغيير السكن		مشاكل أو صعوبات مالية
	مشاكل في العمل		مرض شديد لك أو لشخص عزيز		حوادث أو إصابات
	إهانات لفظية متكررة		الضرب أو الاعتداء الجسدي		موت شخص عزيز
	انفصال عن الزوج أو طلاق		صعوبات في التعامل مع الأولاد		

القسم السادس: استمارة مقياس أدنبرة لاكتئاب ما بعد الولادة **F.**

عزيزتي الأم:

يتكون هذا الجزء من عشرة أسئلة تقيم الحالة النفسية للمرأة في فترة ما بعد الولادة، أرجو منك الإجابة على جميع الأسئلة التالية وذلك بوضع اشارة (x) داخل المربع المقابل للعبارة التي تصف كيف كان شعورك خلال الأيام السبعة الماضية، وليس مشاعرك اليوم فحسب. واليك المثال التالي:

	لقد شعرت بالسعادة: (مثال فقط)

	نعم، كل الأوقات.
x	نعم، معظم الأوقات.
	لا، ليس في أغلب الأحيان.
	لا ، إطلاقاً.
	هذا يعني: لقد شعرت بالسعادة في معظم الوقت خلال الأسبوع الماضي

نرجو منك إكمال الأسئلة التالية بنفس الطريقة

خلال الأيام السبعة الماضية

1.	كنت قادرة على الضحك ورؤية الجانب المضحك من الأشياء والأمور:
	كثيراً كالمعتاد.
	أقل من المعتاد قليلا.
	قطعياً اقل من المعتاد.
	لا لم أقدر إطلاقا.
2.	لقد تطلعت بمتعة لما حولي من الأمور:
	كثيراً كالمعتاد.
	أقل من المعتاد قليلا.
	قطعياً اقل من المعتاد.
	لا لم أقدر إطلاقا.

3.	لقد لمت نفسي بدون داعي عندما كانت الأمور تسير بشكل غير صحيح:	
	نعم، في معظم الأوقات.	
	نعم، في بعض الأوقات.	
	لا، ليس كثيراً.	
	لا، أبدا.	
4.	لقد كنت أقلق بدون أي سبب يدعو للقلق:	
	لا، إطلاقا.	
	لا، ليس كثيرا.	
	نعم، في بعض الأوقات.	
	نعم، دائماً.	
5.	لقد شعرت بالخوف والذعر والفزع بدون سبب قوي:	
	نعم، في أكثر الأوقات.	
	نعم، في بعض الأوقات.	
	لا، ليس كثيراً.	
	لا، إطلاقاً.	
6.	ازدادت متاعبي وأصبحت الأمور صعبة علي:	
	نعم، في معظم الأوقات لم أكن قادرة على التكيف إطلاقاً.	
	نعم، في بعض الأوقات لم أكن قادرة على التكيف كالمعتاد.	
	لا، فمعظم الوقت كنت قادرة على التكيف بشكل جيد.	
	لا، لقد كنت قادرة على التكيف كالمعتاد.	
7.	لقد كنت غير سعيدة لدرجة أني كنت أجد صعوبة في النوم:	
	نعم، في معظم الوقت.	

	نعم، بعض الوقت.
	ليس غالبا.
	لا، إطلاقا.
8.	لقد شعرت بالحزن والتعاسة:
	نعم، في معظم الأوقات.
	نعم، مراراً.
	ليس غالبا.
	لا، إطلاقا.
9.	**لقد كنت غير سعيدة لدرجة أنني كنت أبكي كثيراً:**
	نعم، معظم الوقت.
	نعم، بعض الوقت.
	ليس غالباً.
	لا، إطلاقا.
10.	**راودتني أفكار بإيذاء نفسي:**
	نعم، مراراً.
	نعم، في بعض الأحيان.
	نادرا.
	لم تراودني بتاتا.

عزيزتي الأم..

انتهت الاستمارة.. وتفضلي بقبول خالص الشكر والتقدير على الجهد والوقت الذي قدمته..

الباحث

Annex 3: The English version of the study tool:

An interview about the prevalence and associated factors of postpartum depression in Nablus district

Dear mother,

Giving birth to a new baby is considered as one of the most beautiful moments of life for mother and family, but this moment may be accompanied with some disturbance, especially with the rapid change in the mother's hormones and the need to do a lot of duties for the new baby and the house. Moreover, the mother may be exposed to mood fluctuations that may turn into depression affecting the mother's behavior and role toward herself, her baby and house.

This interview is for a research conducted by Dr. Khubaib Ayoub from the department of public health at An-Najah National University, to assess the prevalence and associated factors of postpartum depression in Nablus district. Knowing the prevalence and associated factors of postpartum depression will lead to deeper understanding of the problem, and to seek effective solutions that positively affect the mother's health and mental wellbeing as well as the health and mental wellbeing of those around her and those she loves.

All the information included in this interview will be dealt with in privacy and confidentiality and it will not be used except for scientific research purposes.

ENDORSEMENT

I am _____ who is signing below, has been informed with the aims and importance of this study, and I freely agree to participate in it, and to give the correct information for the good of the scientific research.

Signature: _____

Section one: Demographic information:

1) Age: date of birth

2) How old were you when you married?

3) Residence: 1) City. 2) Village. 3) Camp.
(state your place of residence_____)

4) Years of education: (state the last class or the last high education year you have studied_____)

5) Occupation: 1) Housewife. 2) employed. 3) other. (please state_____)

6) Family monthly income: (please state the sum of the income of all income-earning persons in the household_____)
- number of household spent for by this income (_____)

7) How do you describe your family monthly income? 1) very poor 2) poor 3) average or satisfactory. 4) good 5) very good or higher.

8) Do you have a health insurance? And what is the type of your insurance? (if more than one type applies, please select all that applies) 1) governmental 2) military 3) UNRWA 4) private 5) no insurance

9) Do your family have a social security card? 1) yes, from the ministry of social affairs
2) yes, from UNRWA 3) no.

Section two: pregnancy and birth related factors:

1) Pregnancy and birth history:
1.1) How many pregnancies have you had including the last one (_____)
1.2) How many births have you had including the last one (_____) 1.3) How many miscarriages and stillbirths have you had (_____) 1.4) How many alive children do you have (_____)

2) During your last pregnancy, what of the following pregnancy-related problems occurred to you:
1) gestational hypertension or preeclampsia (___) 2) gestational diabetes (___) 3) bleeding during pregnancy (___) 4) threatened abortion (___) 5) premature labor or birth (___) 6) severe dizziness and vomiting (___) 7) anemia (___)

3) Where did you last birth took place?
1) governmental hospital 2) private hospital 3) UNRWA hospital
4) others (specify____)

4) The last delivery was: 1) vaginal delivery 2) caesarean section

5) Vacuum assisted delivery was used: 1) yes 2) no

6) Episiotomy and sutures were done 1) yes 2) no
7) Did you want to have the last pregnancy? 1) yes 2) no
8) Have you planned with your husband to have the last pregnancy? 1) yes 2) no
9) How do rate your satisfaction of the medical care during your birth?
1) poor 2) satisfactory 3) good 4) very good 5) excellent
10) In general, do you have any of the following diseases (tick that apply) 1) Hypertension (___) 2) diabetes (___) 3) asthma (___) 4) cardiac disease (___) 5) rheumatoid arthritis (___) 6) other diseases (specify_____)

Section three: newborn related factors: (these questions are related to your last baby)
1) newborn gender 1) male 2) female
2) you wished your baby was 1) a male 2) a female 3) no difference
3) the newborn's weight 1) < 2,500g 2) 2,500-4,000g 3) > 4,000g
4) do your baby have any diseases? 1) yes 2) no
5) was your baby admitted to the neonatal ICU after birth: 1) Yes 2) no
6) Was you baby born before the ninth month of pregnancy? 1) yes 2) no
7) what do you use to feed your baby? 1) breast feeding 2) formula feeding 3) both

Section four: marital and family relationship factors:
1) How do you evaluate your marital life and your relationship with your partner?
1) very poor 2) poor 3) satisfactory 4) good 5) very good
2) how do you evaluate the help and support provided by your husband?
1) very poor 2) poor 3) satisfactory 4) good 5) very good
3) how do you evaluate your relationship with your own family (father, mother, brothers and sisters)? 1) very poor 2) poor 3) satisfactory 4) good 5) very good
4) how do you evaluate your relationship with your mother-in-law?
1) very poor 2) poor 3) satisfactory 4) good 5) very good
5) how do you evaluate your relationship with your husband's family in general?
1) very poor 2) poor 3) satisfactory 4) good 5) very good

6) Maternal Social Support Scale (MSSS)
For each of the following statements, please tick one box which shows how you feel about the support you have right now

	Always	Most of the time	Some of the time	Rarely	Never
a. I have good friends who support me					
b. My family is always there for me					
c. my husband helps me a lot					
d. there is conflict with my husband					
e. I feel controlled by my husband					
f. I feel loved by my husband					

(With permission from Dr. Joan Webster)

Section five: psychosocial stressors and psychological history:
1) Have you ever suffered or a physician told you that you have a mental or psychological illness?
1) Yes 2) no 3) I don't know
2) Has any of your family members ever suffered from a mental or psychological illness?
1) Yes 2) no 3) I don't know
3) Have you suffered from depression during the last pregnancy?
1) Yes 2) no 3) I don't know

4) During the last year or during your last pregnancy, have you experienced any of the following stressors (tick all that apply): 1) abandon a dear person (___)
2) workplace problems (___) 3) recurrent verbal humiliations or abuse (___)
4) separation from husband or divorce (___) 5) housing problems or change (___)
6) severe illness of you or a dear person (___) 7) hitting or physical abuse (___) 8) difficulties in dealing with your children (___) 9) financial difficulties (___) 10) accidents or injuries (___) 11) death of a dear person (___)

<u>Section six: Edinburgh Postnatal Depression Scale (EPDS):</u>

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to <u>how you have felt IN THE PAST 7 DAYS</u>, not just how you feel today. Here is an example, already completed.

I have felt happy:
1) Yes, all the time
2) Yes, most of the time
3) No, not very often
4) No, not at all

This would mean: "I have felt happy most of the time" during the past week.

Please complete the other questions in the same way. In the past 7 days:

1. I have been able to laugh and 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
Rather less than I used to
Definitely 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 often
No, never

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

***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 able to cope at all
Yes, sometimes I haven't been coping as well as usual
No, most of the time I have coped quite well

No, I have been coping as well as ever

***7 I have been so unhappy that I have had difficulty sleeping**

Yes, most of the time
Yes, sometimes
Not very often
No, not at all

***8 I have felt sad or miserable**

Yes, most of the time
Yes, quite often
Not very often
No, not at all

***9 I have been so unhappy that I have been crying**

Yes, most of the time
Yes, quite often
Only occasionally
No, never

***10 The thought of harming myself has occurred to me**

Yes, quite often
Sometimes
Hardly ever
Never

Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. British Journal of Psychiatry 150:782-786 .

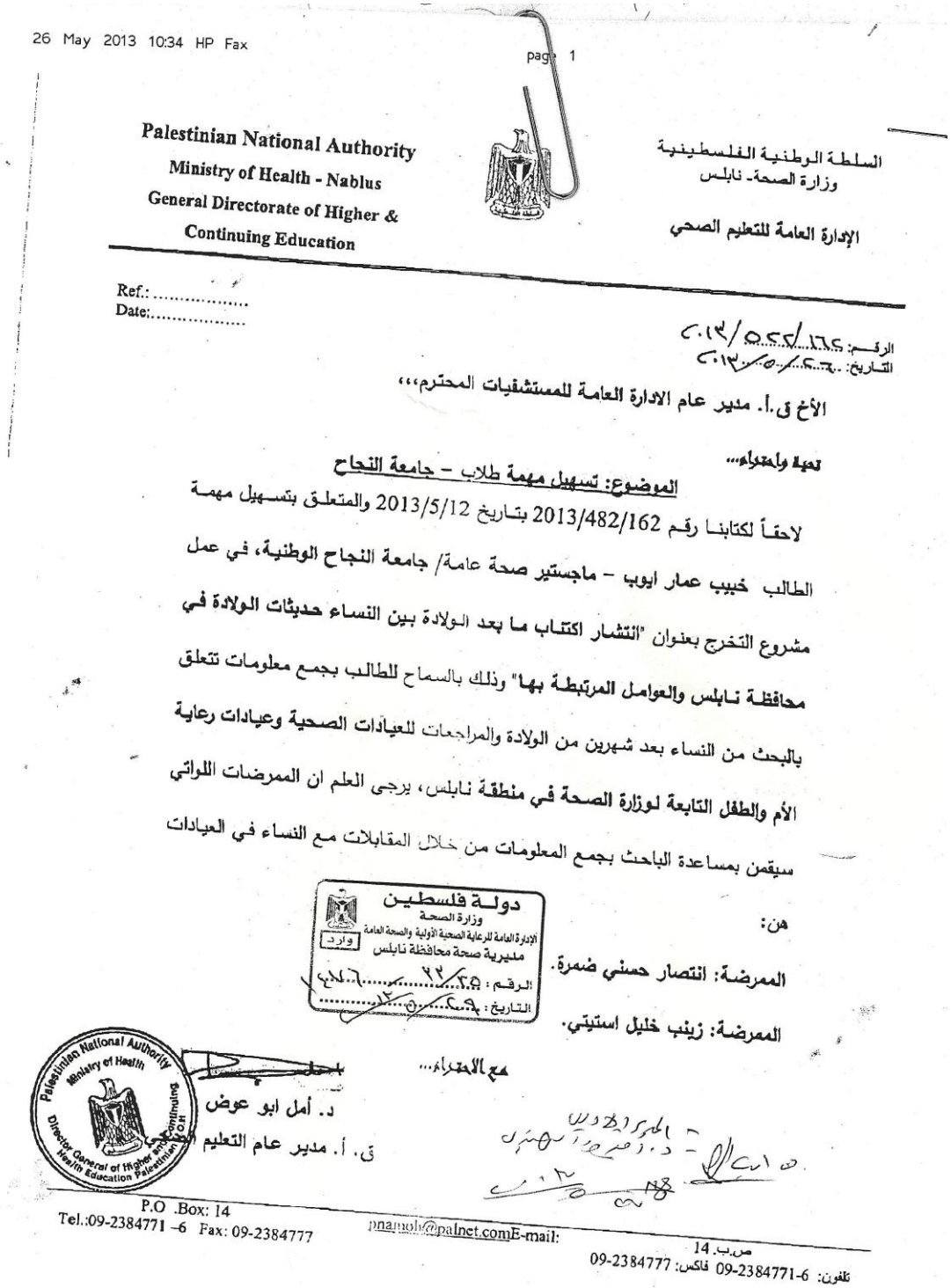
Annex 4: Table of variables:

Variable	Variable type	Categories and category coding (if any)					Definition
The dependent variable							
EPDS score category	Binary	1) non-depressed <10	2) depressed ≥ 10				The final score of EPDS ranging from 0-30 and categorized as depressed (above cut off score) and non-depressed (below cut off score)
	Binary	1) non-depressed <13	2) depressed ≥ 13				
Independent variables							
Age	Continuous						Years lived since birth
	Categorical	1) 18- 25y	2) 26-35y	3) 36 -45y			
Residence	Categorical	1) City	2) Village	3) Camp			Place where participant lives
Years of education	Continuous						Years of formal education received starting in the 1st primary class
	Categorical	1) 0-6 y	2) 7-12 y	3) ≥ 13y			
Occupation	Categorical	1) Housewife	2) employed	3) other			The current occupation of the participant
Average Monthly income	Continuous	May be categorized later					Total monthly income of all income-earning persons in the household / number of household benefiting from it
Perceived status of income	Binary	1) Poor (includes 1-3: very poor, poor and average)	2) Good (includes 4-5: good and very good)				The participant perception of her income and its adequacy rated on a scale of 1-5 from very poor to very good
Insurance	Categorical	1) Governmental	2) military	3) UNRWA	4) Private	5) No insurance	Health insurance type of the participant if any
Security card	Binary	1) Yes (either ministry of social affairs or UNRWA)	2) no				The social security card is a type of financial help given monthly to poor families by either ministry of social affairs or UNRWA; it will be used as an indicator of SES in addition to the income
Gravidity	Binary	1) first pregnancy	2) not first				The order of the last pregnancy
Parity	Binary	1) first birth	2) not first				The order of last birth
Obstetrical	Categorical	1) no complications	2) 1	3) > 1			Presence of one or more of the following complications in the

complications				complication	complication	last pregnancy: gestational hypertension or preeclampsia; gestational diabetes; bleeding during pregnancy; threatened abortion; premature labor or birth; severe dizziness and vomiting; and anemia
Place of delivery	Categorical	1) governmental hospital	2) private hospital	3) UNRWA hospital	4) other	Place where last delivery took place
Type of delivery	Binary	1) vaginal	2) CS			The way that mother given birth in her last birth whether vaginal delivery or Caesarean section
Vacuum use	Binary	1) yes	2) no			Whether vacuum assisted delivery was used in the last birth
Episiotomy and sutures	Binary	1) yes	2) no			Whether episiotomy and suturing was made in the last birth
Pregnancy wanted	Binary	1) yes	2) no			Whether the mother wished to have the last pregnancy or not
Pregnancy planned	Binary	1) yes	2) no			Whether the mother planned to have the last pregnancy or not
Satisfaction of care	Binary	1) poor (1-2, includes poor and satisfactory)	2) good (3-5, including good, very good and excellent)			Mother satisfaction with overall medical care during her last birth rated from 1-5 (poor to excellent)
Medical disease	Categorical	1) no disease	2) 1 disease		3) > 1 disease	Presence of one of the following diseases with the mother: hypertension, diabetes, asthma, cardiac disease, rheumatoid arthritis or other diseases specified by mother.
Newborn gender	Binary	1) male	2) female			
Newborn weight	Categorical	1) < 2,500g	2) 2,500 -4,000g		3) > 4,000g	The weight of the last newborn at birth with categories of low (<2,500g), normal (2,500 -4,000g) and high (>4,000g).
Newborn illness	Binary	1) yes	2) no			Presence of any illness with the last newborn
NICU need	Binary	1) yes	2) no			Whether the last newborn needed admission to neonatal ICU after birth
Prematurity	Binary	1) yes	2) no			Whether the last newborn was born before 9 months of pregnancy
Newborn feeding	Categorical	1) breastfeeding	2) formula feeding		3) both	The type of feeding the last baby is receiving
Marital life	Binary	1) poor (1-3	2) good (4-5 including: good			The participant evaluation of her marital life and relationship

		including: very poor, poor and satisfactory)	and very good)		with her husband on a scale 1-5 ranging from very poor to very good
Husband support	Binary	1) poor (1-3 including: very poor, poor and satisfactory)	2) good (4-5 including: good and very good)		The participant evaluation of the help and support provided by her husband on a scale 1-5 ranging from very poor to very good
Own family relationship	Binary	1) poor (1-3 including: very poor, poor and satisfactory)	2) good (4-5 including: good and very good)		The participant evaluation of her relationship with her own family (father, mother, brothers and sisters) on a scale 1-5 ranging from very poor to very good
Mother-in-law relationship	Binary	1) poor (1-3 including: very poor, poor and satisfactory)	2) good (4-5 including: good and very good)		The participant evaluation of her relationship with her mother-in-law on a scale 1-5 ranging from very poor to very good
Husband's family relationship	Binary	1) poor (1-3 including: very poor, poor and satisfactory)	2) good (4-5 including: good and very good)		The participant evaluation of her relationship with her husband's family in general on a scale 1-5 ranging from very poor to very good
MSSS category	Categorical	1) low social support (0-18)	2) medium social support (19-24)	3) adequate social support (>24)	The level of perceived social support received by the mother is reflected in the total score of Maternal Social Support Scale (MSSS) that is categorized into 3 categories: low (0-18), medium (19-24) and adequate (>24).
Personal Mental history	Binary	1) yes	2) no (includes no and I don't know)		Self report of personal history of mental or psychological illness (having such illness in the past or now or being told by a physician to have such illness)
Family mental history	Binary	1) yes	2) no (includes no and I don't know)		Self report of family history of mental or psychological illness (if any family member has such an illness in the past or now)
Antenatal depression	Binary	1) yes	2) no (includes no and I don't know)		Self report of depression during the last pregnancy
Stressful life events	Categorical	1) no	1) 1 life event	3) > 1 life event	Self report of one or more of the following stressful life event occurring during the last year or during the last pregnancy: abandon a dear person; workplace problems; recurrent verbal humiliations or abuse; separation from husband or divorce; housing problems or change; severe illness of you or a dear person; hitting or physical abuse; difficulties in dealing with your children; financial difficulties; accidents or injuries; and death of a dear person.

Annex 5: Permissions and IRB approval



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Palestinian National Authority
Ministry of Health - Nablus
General Directorate of Higher & Continuing Education

السلطة الوطنية الفلسطينية
وزارة الصحة- نابلس
الإدارة العامة للتعليم الصحي

Ref.:
Date:

الرقم: ٥٥٢/١٦٢/٢٠١٣
التاريخ: ٢٠١٣/٥/٢٦

الأخ ق.أ. مدير عام الادارة العامة للمستشفيات المحترم،،،

تحية واحترام،،،

الموضوع: تسهيل مهمة طلاب – جامعة النجاح

لاحقاً لكتابنا رقم 2013/482/162 بتاريخ 2013/5/12 والمتعلق بتسهيل مهمة الطالب خبيب عمار ايوب – ماجستير صحة عامة/ جامعة النجاح الوطنية، في عمل مشروع التخرج بعنوان "انتشار اكتئاب ما بعد الولادة بين النساء حديثات الولادة في محافظة نابلس والعوامل المرتبطة بها" وذلك بالسماح للطالب بجمع معلومات تتعلق بالبحث من النساء بعد شهرين من الولادة والمراجعات للعيادات الصحية وعيادات رعاية الأم والطفل التابعة لوزارة الصحة في منطقة نابلس، يرجى العلم ان الممرضات اللواتي سيقمن بمساعدة الباحث بجمع المعلومات من خلال المقابلات مع النساء في العيادات

دولة فلسطين
وزارة الصحة
الإدارة العامة للرعاية الصحية الأولية والصحة العامة
مديرية صحة محافظة نابلس
وارد
الرقم: ٢٢/٢٠٥
التاريخ: ٢٠١٣/٥/٢٩

من:

الممرضة: انتصار حسني ضمرة.

الممرضة: زينب خليل استيتي.

مع الاحترام،،،

د. أمل ابو عوض
ق. أ. مدير عام التعليم

Palestinian National Authority
Ministry of Health
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An-Najah
National University
Vice President Office for Academic Affairs

جامعـــــة
النجـــاح الوطنيـــة
مكتب نائب الرئيس للشؤون الاكاديمية

الرقم: ن ك ص/ ٧اي/٢٠١٣
التاريخ: ٢٠١٣/٥/٦

MO Balata
MO Camp No 1

السيد الدكتور امية خماش المحترم
المدير الطبي – الضفة الغربية
بواسطة الدكتور ابراهيم السلقان المحترم
الرئيس الطبي – منطقة نابلس

الموضوع: تسهيل مهمة

تهديكم جامعة النجاح الوطنية أطيب التحيات ونعلمكم بأن الطالب خبيب عمار أيوب طالب ماجستير تخصص الصحة العامة في كلية الدراسات العليا وهو بصدد اعداد اطروحة الماجستير الخاصة به والتي بعنوان (**انتشار اكتئاب ما بعد الولادة بين النساء حديثات الولادة في محافظة نابلس والعوامل المرتبطة بها**) ولاتمام الرسالة يحتاج إلى جمع معلومات عن الاكتئاب من النساء بعد شهرين من الولادة والتي يراجعن العيادات الصحية وعيادات رعاية الأم والطفل التابعة لوكالة الغوث، حيث ستقوم ثلاثة ممرضات بالاتفاق والتنسيق مع الباحث بعمل المقابلات مع النساء في العيادات المذكوره في وقت التطعيم الخاص بعمر شهرين وذلك بعد الموافقة الخطية من النساء المعنيات وستجري المقابلات خلال شهري أيار وحزيران، يرجى من حضرتكم الايعاز للمعنيين في عيادات وكالة الغوث في الضفة الغربية تسهيل مهمة الطالب علما بأن المعلومات لاغراض البحث العلمي فقط.

شاكرين لكم حسن تعاونكم.

وتفضلوا بقبول وافر الاحترام.

نائب الرئيس للشئون الأكاديمية
أ.د. ماهر النتشه

نسخه: د. عميد كلية الدراسات العليا
نسخه: مشرف الطالب.
نسخه: للملف

بسم الله الرحمن الرحيم

An - Najah National University

Faculty of Medicine & Health Sciences
Department of Graduate Studies

جامعة النجاح الوطنية

كليـــة الطب وعـلـوم الصـحة
دائرة الدراسات العليا

IRB Approval letter

Study title:
Prevalence of Postpartum Depression (PPD) among recently Delivering mothers in Nablus District and its Associated Factors

Submitted by:
Khubaib Ayoub

Date Reviewed:
April 8, 2013

Date approved:
April 17,2013

Your study titled " Prevalence of Postpartum Depression (PPD) among recently Delivering mothers in Nablus District and its Associated Factors " Was reviewed by An-Najah National University IRB committee & approved on April 17 , 2013.

Samar Musmar,MD, FAAFP
IRB Committee Chairman,
An-Najah National University

IRB

نابلس – ص.ب 7 او 707 هاتف 14/8/7/4/2342902(09)(970) ، فاكسميل 2342910 (09) (970)
Nablus – P.O.Box: 7 or 707 – Tel (970) (09) 2342902/4/7/8/14 – Faximile (970)(09)2342910
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Permission to use Arabic EPDS validated in Jordan by Dr. Arwa Oweis

--- On Wed, 20/2/13, khobaib badawi <kh_badawi_med@yahoo.com> wrote:

From: khobaib badawi <kh_badawi_med@yahoo.com>
Subject: Request of Arabic EPDS
To: "Arwa@just.edu.jo" <Arwa@just.edu.jo>, "aoweis@philadelphia.edu.jo" <aoweis@philadelphia.edu.jo>
Cc: "Amira Shaheen" <shaheenamira@yahoo.co.uk>
Date: Wednesday, 20 February, 2013, 22:23

Dear Dr Oweis
Greetings

I am a physician and a MSc public health student at An-Najah National University in Palestine who is doing a master thesis about postpartum depression in Nablus district in Palestine. My supervisor is Dr. Amira Shaheen from the depatment of publich health at An-Najah National University.

While reviewing relevant literature I find your PhD thesis entitled " Relationships among the situational variables of perceived stress of the childbirth experience, perceived length and perceived difficulty of labor, selected personal variables, perceived nursing support and postpartum depression in primiparous Jordanian women living in Jordan".

I want to ask for your permission to use the Arabic translated version of the Edinburgh Postnatal Depression Scale (EPDS) that you have used in your study as there are many common things between the Palestinian and Jordanian people. The translation will be reviewed by a panel of experts from Palestine and will be tested in a pilot study for internal consistency and comprehension. I will do appropriate referencing and acknowledgment and inshallah I will communicate the end results with you.

Looking forward to receiving your reply.
Sincerely,

Khubaib Ayoub, MD
MPH student - An-Najah National University.
Primary Care Physician, Al-Rahma Medical Center.
Nablus - Palestine

From: Arwa Oweis <arwa@just.edu.jo>;
To: Amira Shaheen aoweis@philadelphia.edu.jo
CC : khobaib badawi <kh_badawi_med@yahoo.com>
Mar 2, 2013

I am sorry I was out of town and was not able to respond to your request... You have my permission to use the translated instrument...

Take care and wish you luck

Arwa Oweis, RN, DNSc
Dean of Nursing, Director of WHO Collaborating Center
Associate Professor, Maternal and Child Health Dpt.
Faculty of Nursing/ Jordan University of Science and Technology
Head, GRACE-MENA Secretariat (www.grace-network.net)
Irbid/Jordan
Po Box 3030
mob 0797312738

Permission to translate and use MSSS by Dr. Joan Webster

>>> khobaib badawi <kh_badawi_med@yahoo.com> 23/02/2013 12:17 am >>>

Dear Dr Webster

Greetings

I am a physician and a MSc public health student at An-Najah National University in Palestine who is doing a master thesis about prevalence of postpartum depression in Nablus district in Palestine and its associated factors . My supervisor is Dr. Amira Shaheen from the depatment of publich health at An-Najah National University.

As the mothers perception of social support is a very important predictor of postpartum depression, the use of a standardized tool is of a paramount importance. The tool that you have designed (the Maternal Social Support Scale (MSSS)) is one of the best used tool and it was used in Arab Jordanian population with good validity and reliability.

I want to ask for your permission to use the Maternal Social Support Scale (MSSS) in my study after translation to Arabic. The translation will be reviewed by a panel of experts from Palestine and will be tested in a pilot study for internal consistency and comprehension. I will do appropriate referencing and acknowledgment I will communicate the end results with you.

Looking forward to receiving your reply.

Sincerely,

Khubaib Ayoub, MD
MPH student - An-Najah National University.
Primary Care Physician, Al-Rahma Medical Center.
Nablus - Palestine

From: Joan Webster <Joan_Webster@health.qld.gov.au>;
To: Me <kh_badawi_med@yahoo.com>

Feb 27, 2013

Dear Khubaib,

Thank you for your email.

I am delighted that you will be using the MSSS, we find it a very useful screen in practice. You certainly have my permission to use the tool for you research.

Best regards and good luck with your study.

Joan

Professor Joan Webster
Nursing Director, Research
Centre for Clinical Nursing
Building 34
Royal Brisbane and Women's Hospital
Butterfield Street
Herston QLD Australia 4029
Ph +61 7 3646 8590
Fax +61 7 3646 1557
email joan_webster@health.qld.gov.au

Annex 6: The pilot Study results

Eighteen mothers were interviewed in two clinics of Nablus on 25-26/5/2013. 8 mothers were chosen from Al-Markazyia clinic the largest MOH MCH clinic in Nablus and 10 were chosen from UNRWA Balata camp clinic. A high rate of postpartum depression was observed among participants as thirteen mothers (72.2%) were found to be depressed when the EPDS cut off score was 10 whilst this number came down to 8 (44.4%) when the cut off is increased to 13. The mean EPDS score was 10.83 (SD ±5.5) whilst the lowest score was 0 and the highest was 20. This high rate of PPD may be due to the small size of the sample and the convenient approach. Many of those who had depression have experienced hard stressful events and difficulties during their pregnancy.

The mean age was 28.1 (SD ±4.8) and the mean age at marriage was 21.3 (SD ±3.68). The mean years of education was 13 (SD ± 3.2). The mean number of pregnancies was 3.33 (SD ±1.86) while the mean number of alive children was 3.11 (SD ±1.64).

The participants most experienced complication during pregnancy was vomiting and dizziness which was experienced by 13 mothers (72.2%). Only 2 mothers has had anemia and gestational hypertension and only 1 has had gestational diabetes. None had preterm labor, threatened abortion nor antepartum bleeding. Only 2 (11.1%) mothers were already having hypertension before pregnancy, otherwise none of the mothers have had a history of diabetes, cardiovascular diseases, asthma or rheumatism.

Seven mothers gave birth in a governmental hospital and 7 gave birth in private hospitals whilst 4 gave birth in UNRWA hospital. Fourteen mothers gave birth by vaginal delivery (77.8%) where episiotomy was done to 12 of them while none of the mothers reported vacuum assisted delivery. Pregnancy was wanted in 12 mothers only (66.7%). Seven mothers gave birth to a male baby whilst 8 mothers reported that they wanted a male baby. Seven of the babies were ill, 9 were premature and 2 needed neonatal intensive care unit (NICU) admission. Most of mothers used exclusive breast feeding for their babies (77.8%) and the remaining mothers used both breast and formula feeding whilst none of the mothers used exclusive formula feeding at the study time (see table 4).

Participants denied any personal or family history of mental illness whilst 5 mothers (27.8%) reported being depressed during the last pregnancy. The most experienced stressful life event during pregnancy was financial difficulties (38.9%) followed by difficulty in dealing with children (33.3%) and severe illness of the mother or one of her dears (27.8%). Other stressful events are detailed in table 5. Lastly and surprisingly, only 2 mothers (11.1%) reported low social support on the maternal social support scale (MSSS) whilst 8 mothers (44.4%) equally reported medium and high social support on MSSS. In addition, the mean scores of satisfaction with relationships with the husband, own family and mother-in-law were high around 4. Mothers also reported a mean satisfaction of 3.83 (SD ±1.38) of the health care provided during delivery.

Annex 7: Lancet conference abstract.

This abstract was presented as a poster in the Lancet Palestinian Health Alliance Conference held in Amman, March 2014, and it was submitted to be published in the Lancet.

Prevalence and Associated factors of Postpartum Depression among Palestinian Mothers

Khubaib Ayoub*[a]; Amira Shaheen[b]; Shakoor Hajat[c]

Background:
Postpartum Depression (PPD) is a challenging condition and a major public health problem because of its great effect on the mother and her child in a critical period of child development. Nevertheless, it has received less attention in the Palestinian health research and Palestinian primary care and MCH clinics. The aim of this study is to determine the prevalence and associated factors of PPD among women aged 18-45 years in Nablus district.

Methods:
This is a cross-sectional study in which mothers aged 18-45 years from Nablus district were interviewed at 7-12 weeks after birth in 12 of the Ministry of Health (MOH) and UNRWA primary care and Maternal and Child Health (MCH) clinics in the period from The end of May to the mid of June 2013. We used a specially constructed interview consisting of Arabic version of Edinburgh Postnatal Depression Scale (EPDS) and other questions of PPD related risk factors. The EPDS internal consistency was high (cronbach's $\alpha = 0.79$) and we adopted the cut off score of ≥ 10 to define depression.

Findings:
Of the 246 interviews conducted, 235 were valid for analysis. The mean age of participants was 26.13 [95% CI: 25.45-26.8]; the mean years of education were 12.59 [95% CI: 12.2-12.98]; and the mean number of births was 2.59 [95% CI: 2.38-2.79]. 49.8% of mothers live in Nablus city whilst 29.8% and 20.4% live in villages and in refugee camps respectively. Forty mothers (17%) scored ≥ 10 and considered depressed whilst 21 mothers (8.9%) scored ≥ 13 and considered to have severe depression. Univariate analysis showed that depression during pregnancy; positive personal mental history; verbal and physical abuse; 2 or more stressful events during pregnancy; marital separation or divorce; poor satisfaction of the relationships with the husband, the family and the mother-in-law; perceived low social support; and premature baby are strongly associated with PPD. No significant relationships were observed with socio-demographic characteristics (age, education, residence and income); pregnancy and birth factors or baby's gender.

Interpretation:
Prevalence of PPD is high among Palestinian mothers and is mainly associated with psychosocial stressors during pregnancy. We highly recommend the integration of PPD screening into the antenatal and postnatal healthcare services and to give more time to mothers counselling in addition to the medical services offered.

Funding: The research received partial funding from An-Najah National University.

Conflicts of interest
We declare that we have no conflicts of interest.

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a: Medical resident at An-Najah National University Hospital and A Master Public Health candidate at An-Najah National University. b: Assistant Professor of Child Health, Epidemiology and Environmental Health, Head of Public Health department, An Najah University. c: Senior Lecturer in Epidemiology and Medical Statistics, London School of Hygiene and Tropical Medicine.

جامعة النجاح الوطنية
كلية الدراسات العليا

انتشار اكتئاب ما بعد الولادة بين النساء حديثات الولادة في محافظة نابلس والعوامل المرتبطة به

إعداد
خبيب عمار توفيق أيوب

إشراف
د. أميرة شاهين
د. شكور حجات

قدمت هذه الأطروحة استكمالاً لمتطلبات درجة الماجستير في الصحة العامة بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس –فلسطين.
2014

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د. شكور حجات

الملخص

مقدمة:

يعد اكتئاب ما بعد الولادة تحديا صعبا ومشكلة هامة في الصحة العامة بسبب تأثيره الكبير على الأم وطفلها في فترة حرجة من تطور الطفل. ومع ذلك، فإنه يلقى القليل من الاهتمام في عيادات الرعاية الصحية الأولية وعيادات صحة الأم والطفل الفلسطينية. الهدف من هذه الدراسة هو تحديد مدى انتشار اكتئاب ما بعد الولادة والعوامل المرتبطة به بين النساء اللاتي تتراوح أعمارهن بين 18 و45 عاما في محافظة نابلس.

منهجية البحث:

هذه الدراسة هي دراسة مقطعية، حيث أجريت فيها مقابلات مع 246 من الأمهات اللاتي تتراوح أعمارهم بين 18 و45 عاما، واللاتي تم اختيارهن بطريقة غير عشوائية من 12 عيادة من عيادات الرعاية الصحية الأولية وصحة الأم والطفل التابعة لوزارة الصحة الفلسطينية ووكالة غوث وتشغيل اللاجئين (الأونروا) في منطقة نابلس. حيث أجريت المقابلات ما بين 7 إلى 12 أسبوع بعد الولادة في شهري أيار وحزيران 2013، باستخدام نسخة عربية من مقياس أدنبرة لاكتئاب ما بعد الولادة (حد القطع $\leq$ 10) إضافة لأسئلة أخرى حول العوامل المرتبطة باكتئاب ما بعد الولادة.

النتائج:

تم تحليل 235 مقابلة صالحة بمتوسط عمري 26.13 سنة، *[95% CI: 25.45-26.8].* 49.8٪ من الأمهات يسكنّ في مدينة نابلس في حين تسكن 29.8٪ و20.4% في القرى

ومخيمات اللاجئين على التوالي. كان عدد الأمهات اللاتي حصلن على نتيجة (حد القطع ≤ 10) ويعانين من اكتئاب تساوي 40 أماَ (17%) منهن 21 (8.9%) حصلن على (حد القطع ≤ 13) وتم اعتبارهن يعانين من اكتئاب شديد.

وقد أظهر التحليل الإحصائي أن الاكتئاب أثناء الحمل؛ وجود تاريخ مرضي للأمراض النفسية؛ التعرض إلى اثنين أو أكثر من ضغوطات الحياة الشديدة أثناء فترة الحمل؛ سوء الرضا عن العلاقة الزوجية؛ سوء الرضا عن مساعدة الزوج ودعمه، وسوء الرضا عن العلاقة مع الحماة (والدة الزوج)؛ والدعم الاجتماعي المنخفض كلها عوامل ترتبط بقوة مع حدوث اكتئاب ما بعد الولادة. و لم يلاحظ أي ارتباطات ذات دلالة إحصائية بين اكتئاب ما بعد الولادة والخصائص الاجتماعية والديموغرافية (العمر، والتعليم، والسكن والدخل)؛ والعوامل المرتبطة بالحمل والولادة أو المولود.

الاستنتاج والتوصيات:

يعتبر انتشار اكتئاب ما بعد الولادة بين النساء الفلسطينيات مرتفعا ويرتبط أساسا مع الضغوطات النفسية والاجتماعية خلال فترة الحمل. وعلى الرغم من أن هناك حاجة إلى إجراء مزيد من البحوث في هذا المجال نظرا لصغر حجم العينة والنهج غير العشوائي في اختيارها، إلا أننا نوصي بشدة بدمج الكشف المبكر عن اكتئاب ما بعد الولادة في خدمات الرعاية الصحية قبل الولادة وبعدها، وإعطاء مزيد من الوقت لتقديم المشورة للأمهات إضافة إلى الخدمات الطبية المقدمة لهن.