Social Resources and Arab Women's Perinatal Mental Health: A Systematic Review

Abstract

Background: Women's mental health in the perinatal period is understudied worldwide and in Arab countries especially.

Aim: This systematic review explores evidence of the association between women's social resources for empowerment in the Arab World and their mental health in the prenatal and postnatal (≤ 1 year postpartum) periods.

Methods: Guided by Kabeer's framework of empowerment, the authors applied a search string in *PubMed* and *Web of Science* databases to identify studies in countries of the Arab League (hereafter the Arab World) that address mental health and social resources for women's empowerment in the perinatal period.

Findings: Of 1865 electronically retrieved articles, 23 met the inclusion criteria. Overall, the majority of studies found a positive association between social resources for empowerment and perinatal mental health. Seven studies explored the relationship between familial or general social support and prenatal mental health in Arab women, and found a significant positive association. Sixteen of the 18 studies of women in the postnatal period found that enabling familial, extra-familial, and/or general social support was positively associated with mental health.

Conclusion: This review demonstrates an association between social resources and perinatal mental health, but there is a dearth of research in this area. We call for additional research on Arab women in the perinatal period using context-specific but standardized tools to assess social resources and mental health. Evidence on positive mental health, resilience, and the influence of social resources can guide the improvement of prenatal and postpartum care services.

Keywords: Mental health, Perinatal, Social support, Depression, Stress, Arab

1. Introduction

Statement of Significance

Problem

Research is lacking on pregnant and postpartum women's mental health and its association with social resources for empowerment in the Arab World.

What is already known

Extant literature indicates that the prevalence of depression, among other mental health issues, is high among women in the perinatal period, especially Arab women.

What this paper adds

This review is the first to systematically synthesize research on the association between women's social resources for empowerment and their perinatal mental health in the Arab World. In addition to identifying future research needs, we highlight evidence on mental health and social resources that can inform improvements in maternal care services for Arab women.

Pregnancy and childbirth are among the most complex experiences women encounter in their lifetimes, with potentially negative implications for mental health. Physical and psychological changes associated with pregnancy and childbirth can increase the risk for psychological morbidity throughout the prenatal and postnatal periods.[1,2] In turn, perinatal mental disorders can have significant negative effects on maternal and child health outcomes, causing increased rates of hospitalization and negative experiences of childbirth for the mother, and long-term complications for the child's cognitive, emotional, and behavioral development.[1,3]

The prevalence of mental disorders in the perinatal period is about 10-15% in western societies, with depression as the most commonly diagnosed disorder.[3] Elsewhere, estimates of postpartum depression range from 13.5% among Chinese women to 23% and 34.7% in Indian and South African women, respectively.[4] In twelve countries of the Arab region, the reported prevalence of postpartum

depression varied widely from 10% to 51.8%, thus exceeding significantly the global average in some cases,[1] although the different methodologies and measurements used in these studies must also be considered.

Despite documented high levels of perinatal mental disorders, resources for maternal mental health services are deficient throughout the world and in the Arab region.[3] In addition to gaps in the provision or quality of mental health care services, stigma is also a significant challenge impeding access to much needed care.[2,3] The fear of stigma may be especially powerful in the case of Arab women, as it affects their marriageability and family reputation.[5] Women may turn to traditional healers or to their families for support in the face of stigma, making social support an important focus of perinatal mental health care. It is necessary to highlight mental health issues among pregnant and postpartum women and incorporate appropriately contextualized mental health care and support in maternal and child health services and at the community level.

1.1 Social resources for empowerment affect mental health outcomes

Access to social resources, exposure to stressors, and the ability to make personal life choices shape women's empowerment, which is an important determinant of mental health particularly in the perinatal period.[2] To understand the social contextual factors that contribute to the development of prenatal and postnatal stress, depression, anxiety or psychological morbidity among Arab women, we refer to Kabeer's framework of women's empowerment.[6] Kabeer defines empowerment as the process by which women acquire resources that enable them to exert choice and control in their life (also known as voice and agency), with increased agency leading to achievements, such as better mental-health outcomes (Figure 1).[6] Enabling resources for empowerment encompass three types: 1) economic resources, such as employment, income, and material assets; 2) human resources, such as formal schooling and skills; and 3) social resources or social support, which is the focus of this systematic review.[6]

[Figure 1]

1.2 Social resources for empowerment and their link to mental disorders

Broadly defined, social resources or support is an act freely provided by individuals, which produces an immediate or delayed positive psychosocial condition in people's life, contributing to a sense of membership of a group, in which one can share reciprocal affection, assistance, and commitment.[7] One's spouse or partner, family members, friends, organizational groups, work-related colleagues and community can provide social support.[7] For example, some scholars characterize Arab families as having strong social ties that empower members and facilitate positive mental health.[5] Social resources are composed of five dimensions: affective (physical expression of love), instrumental (financial assistance and provision of resources), emotional (love, affection, care, and empathy), informational (guidance and advice) and positive interaction support (availability for fun and relaxation).[7] While those dimensions are indicators of positive social support, violence and conflicts can be important indicators of poor social support.

Within Kabeer's framework for empowerment, access to social resources along with agency are important determinants of health.[6] Studies have shown that, during stressful life events such as pregnancy, social resources can provide women with physiological and psychological benefits, including decreased risk of depression, which in turn can positively influence women's pregnancy outcomes.[7] Furthermore, lack of enabling social resources in pregnancy constitutes an important risk factor that can result in adverse effects on pregnancy outcomes, including preterm birth, low birth weight and postpartum depression.[2,7] Other studies highlight the importance of the different forms of social resources a woman may receive for her prenatal and postnatal mental health. For example, in a prospective cohort study in Japan, fewer social resources, measured as the number of persons providing social support, was positively associated with postpartum depression.[8] Studies have also shown spousal

support, or family support in general is protective against the development of depression during pregnancy.[1,4]

1.3 Mental health in pregnant and postpartum women in the Arab World

1.3.1 The Arab World: Social and political context of health

The "Arab World" is a term used to describe the twenty-two countries that form the Arab League spanning the northern and northeastern parts of Africa and southwest Asia. The region is home to almost 400 million inhabitants, the large majority of whom identify as Arab and Muslim.[1,9] A large contingent of Arab migrants comprise the ex-regional diaspora, driven out by economic hardships or by the different forms of violent conflict and political insecurity, which have long mired the region.

Conditions for health, including mental health, are shaped by the unique features of the region. The Arab population is largely comprised of youth, with 60% of the population under 19 years of age.[3] The region suffers from military and civil conflicts, water and food-insecurity, high unemployment levels, and very low rates of women's participation in the labor force.[3,10] Despite the historical, cultural and linguistic commonalities shared by Arab countries, the region is not homogeneous. In terms of economic development, the Arab World is home to countries with the highest (Qatar, Kuwait and United Arab Emirates) and the lowest (Somalia and Comoros) GDP per capita in the world. There are both between-country and within-country disparities in key health and development indicators, including life expectancy, maternal mortality ratios, and access to health services.[10] Arab countries differ in the scope and financing of health services, including mental health services.[11] A 2007 review of mental health services in the Arab world found a wide variation between countries, and an overall deficiency in specialized health care professionals, mental health legislation, and allocated budget for mental health.[11]

1.3.2 Mental health in the Arab World

In the Arab World, awareness of mental health is generally low, and attitudes about mental health services often are negative.[3,5] For reasons related to the organization and provision of services but also to stigma and religious beliefs about the etiology of mental disorders (including concepts such as the evil eye or satanic spirits), women may seek care for their mental health issues from sources outside the health sector, including traditional healers.[5] Families are a significant source of support in the collectivist Arab culture, and family members are often cited as important partners in the provision of mental health care.[1,5]

Most Arab World studies of mental health in the prenatal and postnatal periods have focused on depression. New cases of depression have been shown to be highest during the prenatal period,[4] although the majority of studies have focused on the postnatal period, resulting in a dearth of research on prenatal depression in the Arab World. The few studies investigating perinatal mental health issues find that Arab women often experience higher rates of perinatal depressive symptoms than do women in other regions.[3,12-14] Perinatal mental health morbidities are especially salient in the Arab world, considering the high fertility rates that persist in Arab countries such as Iraq and Sudan.[9] Perinatal health morbidities are particularly interesting in the context of the cultural emphasis on support from extended family members. It can be that the dynamics of the woman's family act as a stressor that increases her risk of mental health challenges, rather than as a social resource that enhances a woman's mental wellbeing.[6] Hamdan (Ref.5, p. 607) refers to the notion of "too much or overly intrusive support" in the Arab culture, which needs to be managed in a manner that reduces rather than exacerbates stress.

Accordingly, there is a need to synthesize existing research from the region in order to address the empirical question regarding the role of the family and other types of social support as facilitators or barriers to empowerment and to women's mental health and well-being in the perinatal period. Answering such questions will help identify current gaps in care and guide the design of comprehensive perinatal mental health care services in this region.

In this paper, we aim to answer the question *"What is the association between social resources for empowerment and mental health outcomes among Arab women living in the Arab World?"* Accordingly, we systematically reviewed studies from the countries in the Arab World that address mental health and social resources for women's empowerment in the prenatal and postnatal periods, with postpartum limited to one year after birth. We focus on studies of the relationship between women's social resources for empowerment with measures of depression, anxiety, and stress during the pre- and postnatal periods.

2. Methods

2.1 Sources

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[15] checklist and the Meta-analysis Of Observational Studies in Epidemiology (MOOSE)[16] guidelines for conducting systematic reviews. Drawing on Kabeer's framework, our search string consisted of social resources for empowerment (including violence) as the set of exposures or explanatory variables and mental health as the achievement (outcome). Additional elements included pregnancy stage as well as the countries and geographical region (Figure 2). We identified, piloted, and revised the search string in two different databases: PubMed and Web of Science. Based on the literature on women's mental health, social resources and empowerment, and following the search string pilot, we specified the inclusion and exclusion criteria. The inclusion criteria included quantitative studies on the association between social resources and mental health among pregnant or postpartum Arab women living in countries of the Arab World as classified by the World Bank (Figure 2). Qualitative studies are essential in drawing an in-depth view and analysis of the topic studied, however their methodology and subsequent analysis differ from that of quantitative studies. Accordingly, we anticipated that comparison across studies of different methodologies would be challenging, and as such decided to exclude qualitative studies. Additional exclusion criteria included women living outside of the Arab

158 World, because they generally experience different contexts and face different challenges, as well as
159 women with clinically diagnosed psychiatric disorders, as the focus of this review is population-based
160 studies. A complete list of the inclusion and exclusion criteria is provided in table 1.

161 [Figure 2]

162 [Table 1]

163 *2.2 Study selection*

164 After applying the final search string in the two selected databases, two authors independently
165 screened the titles and abstracts of the 1865 studies retrieved, guided by the inclusion and exclusion
166 criteria. To ensure consistency of the inclusion and exclusion criteria application, the two authors pilot-
167 tested the criteria on a subset of five full-text articles and reviewed the retrieved articles independently.
168 Any discrepancies in initial decisions about the inclusion or exclusion of retrieved articles were discussed
169 and resolved by consensus. The authors then excluded 1778 studies that did not meet the inclusion
170 criteria and reviewed the full text of the 87 included articles. A Cochrane Review data extraction form[17]
171 adapted specifically for this review was used. The full-text review of retrieved articles resulted in the
172 identification of 21 articles for inclusion in the review.

173 Following the full-text review, two supplemental search strategies were used to identify
174 additional eligible articles. First, a manual search of the reference lists of included articles yielded 99
175 additional studies for screening, including 24 articles for full text review. Two of the 24 reviewed articles
176 met criteria for inclusion in the analysis. Second, the corresponding authors of each included study were
177 contacted for additional relevant articles. The latter strategy did not yield any additional articles. Hence,
178 the entire search, screening, review, and selection process resulted in 21 articles from the initial search
179 and two additional articles from the supplemental searches, resulting in a total of 23 articles for final
180 inclusion in the review (Figure 3).

181 [Figure 3]

2.3 Analysis and study quality

We assessed the quality of the 23 included studies using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist.[18] Guided by the 22 items in the STROBE checklist, three authors reviewed the included studies for quality of reporting. A score was assigned independently to each study. Scores were reviewed, and discrepancies were resolved by consensus. Studies with scores of 14 or below out of 22 possible points were categorized as low quality; those with scores of 15 to 17 as medium quality, and studies with scores of 18 or higher were categorized as high quality.[19]

Studies also were assessed for risk of selection, exposure, confounder and attrition biases using an adapted checklist previously used in other systematic reviews of women's pregnancy outcomes, including perinatal mental health.[20] The studies were assessed for selection bias and scored as low-, moderate-, or high-risk, depending on the clarity of the sample selection process and the representativeness of the sample. Exposure bias was assessed based on the metric specificity and the regional validation of the measurement items or scale used. The risk of outcome bias was scored based on mental health instrument validation in the Arab World region. Studies were scored low on the risk of confounder bias if researchers controlled for all or most common confounding factors. Studies that scored as moderate risk controlled for few confounders, and did not control for most common confounders. Studies high on the risk of confounder bias did not control for any confounders. Finally, we assessed the risk of attrition bias based on the number of subjects retained from initiation of the study to final outcome assessment, including the percentage of non-response for cross-sectional studies, the percentage of attrition for cohort studies, and the reporting of reasons for non-response or attrition. Overall bias was determined based on the most frequent level of bias across the four different risks of biases.[20]

3. Results

3.1 Description of studies

Although the inclusion criteria allowed for articles written in English, French or Arabic, 19 of the 23 included articles were published in English, with only four articles in French, and none in Arabic. The studies were conducted in countries across the Arab World, with a majority (13 studies) from middle-income countries (Lebanon-4, Jordan-3, Tunisia-3, Morocco-2, and Egypt-1), and fewer than half (10 articles) from high-income countries, including UAE (3), Qatar (2), Oman (2), Saudi Arabia (1), Bahrain (1), and Kuwait (1). Unfortunately, Arab countries classified as low-income (e.g. Sudan and Yemen) lacked any studies that met the inclusion criteria. Almost all studies had an observational design (12 cross-sectional and 10 cohort), except one study, which was a randomized controlled trial. Sampling designs at the participant level included convenience sampling, taking a complete census at the study site (e.g. hospital, medical center), and systematic random sampling of the study population. Sample sizes ranged from 56[14] to 1659[21] (Table 2), and included women aged 15 years and above. The majority (18) of included studies assessed women postnatally. Only seven studies assessed women prenatally, and two studies assessed women in both the prenatal and postnatal period. Most studies assessed more than one type of social empowerment resource. Family support, especially support from the spouse, was the main social resource for empowerment measured (21 studies). Extra-familial social resources in three studies were measured in the form of friends, confidants, or hotline services. Three mental health outcomes were measured including depression (23 studies), stress (3 studies), and anxiety (3 studies). Depression was measured most frequently using the Edinburgh Postnatal Depression Scale (EPDS) (17 studies).

[Table 2]

3.2 Bias assessment

The majority of studies had moderate risk of selection bias. Only four studies scored high on selection bias because the sample selection process was not clear or appeared to be non-representative

of the study population. Most studies scored low or moderate for risk of attrition bias, with only three studies showing high risk of attrition bias, as the authors did not report the reasons for losing more than 20% of the participants. Ten studies were determined to have low risk of exposure bias, as they used regionally validated questions or scales to measure social resources, including the Duke Social Support and Stress Scale (DUCOS),[22] Maternity Social Support Scale (MSSS),[23,24] Multidimensional Perception of Family Social Support (MDPSS-Fa),[25] Multidimensional Perception of Friends' Social Support (MDPSS-Fr),[25] Multidimensional Perception of Others Social Support (MDPSS-Oth),[25] or AZRIN Marital relationship scale.[24] While most studies (20) used regionally-validated mental health scales, and thus were low on the risk of outcome assessment bias, three studies administered non-validated outcome assessment tools and were scored as "moderate" on the risk of outcome assessment bias. Almost half of the studies (9) were low on the risk of confounding bias, as they controlled for most or all confounding factors commonly associated with perinatal mental health. Seven studies included fewer than three common confounding factors and were scored as moderate on the risk of confounding bias. Another six studies did not control for any confounding factors and were determined to have a high risk of confounding bias (Table 3).

[Table 3]

3.3 Association of women's social resources for empowerment and their prenatal mental health

A minority of studies (7) assessed the association between social resources and the mental health of pregnant Arab women. These prenatal mental health studies assessed two main types of social resources: familial support and general social support (familial and extra-familial social support combined) (Table 4).

3.3.1 Familial social support

All but one of the six studies that assessed women's access to familial social resources in the prenatal period found a significant positive association between access to at least one type of familial

254 social support (e.g. spouse or mother-in-law) and mental health. The majority of studies assessing the
255 association of women's familial social support with women's prenatal mental health focused on spousal
256 support as a resource, with four out of six studies finding a significant positive association between
257 spousal support and prenatal mental health. Of those four studies, two studies - one in Morocco,[26] and
258 one in Lebanon[27] - used bivariate analysis and showed that poor spousal social support was significantly
259 associated with higher levels of depression.

260 Two other studies – one in Egypt,[28] and one in Oman[29] – using multivariate analysis discovered
261 that marital conflict or domestic violence (indicators of poor social support) were significant predictors
262 of poor prenatal mental health (one study focusing on depression and another on anxiety and
263 depression combined). Another two studies using multivariate analysis –one in Kuwait[30] and one in
264 Jordan[23]- showed there was no significant association between spousal social support and prenatal
265 mental health. The differences in the findings of these studies could not be attributed to differences in
266 region of study, bias level, or STROBE scores; as no patterns were evident based on variation in the
267 study's location (or country's economic level), bias levels and STROBE scores.

268 Beyond spousal support, three studies measured other forms of family social support in relation
269 to prenatal mental health. Poor family support was assessed in the form of mother-in-law relationship
270 difficulties[23] and proved to be a predictor of depression during pregnancy (1 study). Furthermore,
271 general support from the immediate or extended family was measured in two studies using multivariate
272 analysis and found not to be associated with mental health (depression and anxiety combined in 1
273 study[28], depression in 1 study[27]).

274 *3.3.2 General social support (familial and extra-familial)*

275 Broader measures of social support that did not differentiate between familial and extra-familial
276 sources also were identified. Overall, general social support was unrelated to the risk of depression,
277 while familial and non-familial assault or stressful relationships were significantly associated with an

increased risk of depression. One study[22] conducted in Jordan used multivariate analysis to evaluate social resources inclusive of family and non-family forms of social support as well as familial and non-familial stressful relationships. The study confirmed that only stressful relationships are significantly associated with depression. Two other studies, also using multivariate analysis, showed similar results. One study conducted in Jordan[23] highlighted that general social support (measured by MSSS) was not predictive of prenatal depression, and a study in Kuwait[30] revealed that women exposed to familial or extra-familial assault were significantly more likely to develop prenatal depression.

[Table 4]

3.4 Association of women's social resources for empowerment and their postnatal mental health

Eighteen studies assessed the relationship between women's social resources and their postnatal mental health. Overall, the majority of these studies (16) discovered a positive association between social resources and mental health, regardless of whether researchers assessed the relationship at the bivariate level or the multivariate level. In this paper, we organized results of the relationship of women's social resources and perinatal mental health according to whether the social resource was familial, extra-familial or general (combined familial and extra-familial) (Table 5).

3.4.1 Familial social support

Most of the included postpartum studies (16) evaluated familial social support as a measure of social resources for empowerment. These studies generally revealed the relationship with mental health to be positive, whereby poorer social support was associated with a higher incidence of depression, stress or anxiety. Family social supports measured included support of the woman's spouse, mother, mother-in-law, and other kin.

The majority of familial social resources studies (13) measured spousal support as a social resource. Twelve of these thirteen studies significantly linked spousal social support and women's mental health including depression, anxiety, and stress. Half of the twelve studies performed bivariate

analysis and confirmed that poor spousal support was significantly associated with poor mental health, specifically depression. The remaining six studies assessed spousal support using multivariate analyses, and found it to be a predictor of depression (5 studies[31-35]) , as well as anxiety and stress (1 study[21]).

Other sources of familial social support reported were support from a woman's mother and from her mother-in-law. The mother as a social resource was measured in two studies[14,33] using bivariate analysis, with no relationship observed in either study. Four studies measured relationship with the woman's mother-in-law, with three of these four studies[14,23,34] finding difficult relationships were significantly associated with postpartum depression.

Many studies (9) measured familial social support more generally, with no specification of a family member. These studies often revealed that the lack of such support was significantly related to the onset of postnatal depression or anxiety. One study[33] used bivariate analysis and highlighted a significant positive association between general family support and mental health in the postpartum period. Five other studies used multivariate analyses and also found general family social support to be associated with lowered depression[12,21,25,34,36] and lower anxiety[21]. Three other multivariate analyses did not indicate an association between support of the general family and the onset of postnatal depression.[32,35,37]

3.4.2 Extra-familial social support

Only three studies assessed the association between non-familial social support and women's mental health in the postpartum period, with inconsistent findings across studies. Forms of non-familial social support measured included support from social providers, friends, and other general non-familial social support. Researchers in one study[38] using bivariate analysis revealed a significant association between a "service provider" as a source of non-familial social support and reduced stress in Lebanese women 8 to 12 weeks postpartum. Researchers in two other studies used multivariate analyses to measure the support of friends but discovered no significant links to postpartum depression. One of

these studies[13] included a question measuring the number of confidants, which was validated as part of the entire questionnaire, while the other study[25] used a validated version of the MDPSS-Fr scale. Both studies measured depression using the EPDS but applying unmatched cut off points. In addition to friends' social support, Yehia et al.[25] measured general social support using a validated scale (MDPSS-Oth) and multivariate analysis but with no significant relationship established.

3.4.3 General social support (familial and extra-familial)

Two studies used the MSSS scale to assess general social support without differentiating between familial and non-familial social support but had inconsistent results in their association with postpartum depression. One bivariate study in Tunisia[24] found no association. The other study[23] showed low levels of familial and non-familial social support was a predictor of postpartum depression among Jordanians.

[Table 5]

4. Discussion

The limited published literature on perinatal mental health in the Arab World points to a higher prevalence of poor mental health outcomes, such as depression, among Arab women in the perinatal period as compared to other regions.[13,14,22] This systematic review is the first to explore how the presence or acquisition of enabling social resources may influence women's prenatal and postnatal mental health in the Arab World. Synthesizing existing literature is essential in guiding future research on mental health as well as informing interventions that aim to build positive mental health and to improve maternal mental health outcomes.

Overall, evidence from this systematic review points to an association between the social support a woman receives and her mental health during pregnancy. Studies included in this review revealed a significant association between at least one enabling social resource and Arab women's prenatal mental health. However, those seven studies were limited, and the associations found were not consistently significant, in part due to the use of different measurement instruments. Familial support, specifically

support from a spouse, was positively associated with prenatal mental health in most of the studies. Support from the mother-in-law was assessed in only one study, making it difficult to draw any conclusions. In Arab societies, many women live with their husband's family after marriage,[14] and the mother-in-law is a central figure with significant influence over daily life decisions, including childcare.[1] Studies included in the review did not assess other types of familial social resources in relation to prenatal health, such as support of the natal mother. A lack of general social resources (both familial and extra-familial) was positively associated with prenatal depression, although more studies are needed to draw a firm conclusion.

Compared to the small number of studies focusing on prenatal mental health, a larger number of studies in this review (n=18) focused on postpartum mental health. In 12 of 13 studies, there was strong evidence that inadequate spousal support was associated with poorer postnatal mental health. Few studies assessed support of other family members (mother and mother-in-law) making it difficult to draw firm conclusions on how this particular form of social support may be associated with a woman's postnatal mental health status. Overall, general family support (not specific to one family member) was positively associated with postnatal mental health. However, the association of women's extra-familial and general social supports with mental health outcomes were inconsistent, making it difficult to draw conclusions.

Inconsistencies in the results of reviewed studies are attributed, at least partly, to measurement issues. Most studies that measured social resources used ad hoc items not based on a theoretical framework, making it difficult to compare mental health outcomes across studies. Social resources were measured using a wide variety of definitions and tools. For example, spousal support was operationalized in terms of marital conflict, poor marital relationships, dissatisfaction with the marital relationship, and domestic violence before and after birth, among other definitions. In some cases, social support was measured using scales such as AZRIN or MSSS, while in others a single item was used

(e.g. *did any of your family stay with you?*). The same measurement tools (e.g. EPDS) used different cut off points across studies, likely affecting the comparability of results. Analysis of the quality of included articles showed a range of variability, with more than half the studies assessed as high risk for at least one type of methodological bias (selection, exposure, outcome, confounder or attrition).

The studies included in this review showed that perinatal mental health research in the Arab world is skewed in terms of geographic scope, specific conditions, and period of pregnancy. Specifically, there were no studies of women living in low-income Arab countries, despite their greater vulnerability to mental ill health, as compared to women living in middle- or high- income countries.[1,5] There was a skewed focus on depression, with very little research on stress, anxiety or other psychological morbidities, and the large majority of existing studies focused on postnatal mental health with very few studies assessing prenatal mental health. Finally, the nature of social support that was measured in the retrieved articles was limited primarily to familial, including spousal, support with little research examining the support of other family members or close relationships outside the family, and most did not delve into the nature of the support provided.

Despite its limitations, this article systematically reviews studies that assess social resources for women's empowerment and their association with prenatal and postnatal mental health of Arab women living in the Arab World. Accordingly, it provides health practitioners and governmental and non-governmental organizations with a baseline for the development of future interventions that encourage social support and incorporate women's beliefs in the provision of effective, appropriate, and acceptable care.[2] This is important in a region where mental health research and services have been misaligned with the large and growing burden of mental ill health, especially among women[3,11] and where social and political determinants of health continue to deteriorate.

5. Conclusion and implications

In this systematic review, we follow the Kabeer framework to explore the influence of empowering social resources on maternal mental health in the Arab World. Evidence suggests the importance of women's social resources as a key tool for policy makers and health care providers seeking to improve women's empowerment and perinatal mental health. We call for future research to decrease reliance on the medicalization of perinatal mental health, and instead focus on social resources for the improvement of women's mental wellbeing. This review highlights the need for further research focused on social resources for empowerment and perinatal mental health in the Arab world, especially in low-income countries. Furthermore, we call for future studies to extend their focus beyond the assessment of depression to other mental health outcomes, such as stress and anxiety. Future research is also needed to assess the support of specific family members other than the spouse, such as the mother and mother-in-law, or of extra-familial resources such as service providers, community groups, or hotlines. There is also a need for quantitative and qualitative research that examines the mechanisms by which social support influences women's perinatal mental health. Future research may refer to the Kabeer framework and explore the association between social resources and women's increased agency as a pathway to improve perinatal mental health, and as such, the field would benefit from studies exploring this association. This further emphasizes the necessity of using theoretically based, standardized, and context-specific instruments in the measurement of social resources and mental health in Arab populations.

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Figure 1. Conceptual framework for women's empowerment (Kabeer, 1999)[6]

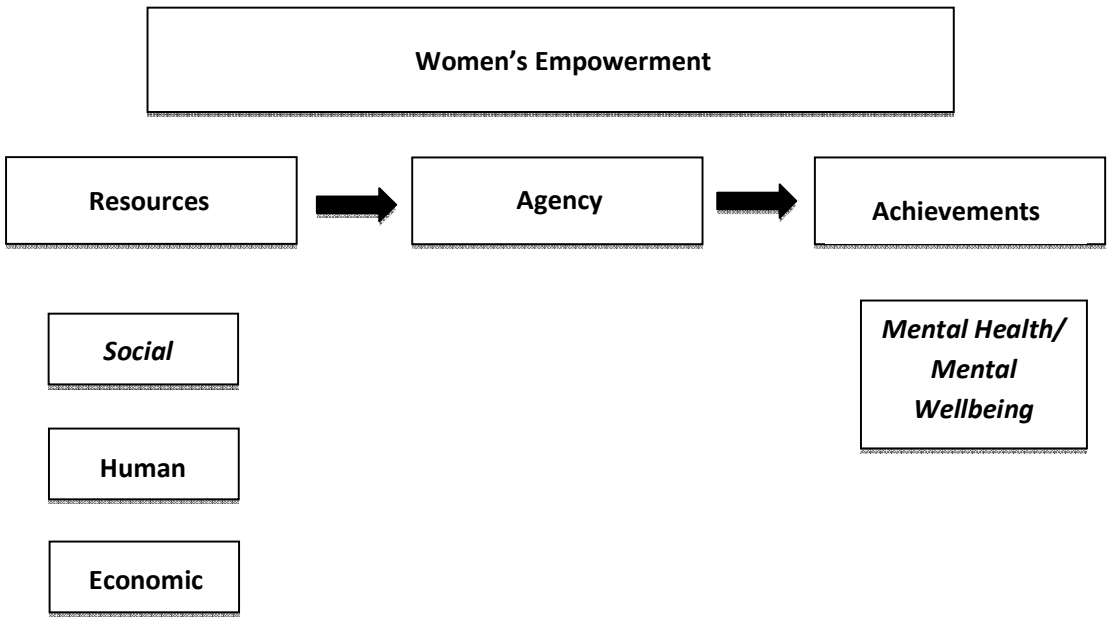

Figure 2. Search terms for identifying the associations between social resources and mental health outcomes

Search Terms						
Social resources	*AND*	***Pregnancy stage***	*AND*	***Country/Geographic Region***	*AND*	***Mental Health Outcomes***
(support **OR**		(pregnancy **OR**		(Algeria **OR**		(stress **OR**
social support **OR**		natal **OR**		Bahrain **OR**		anxiety **OR**
relationships **OR**		prenatal **OR**		Comoros **OR**		depression **OR**
networks **OR**		perinatal **OR**		Djibouti **OR**		depressive symptoms **OR**
connections **OR**		postnatal **OR**		Egypt **OR**		mental health **OR**
social capital **OR**		gestation **OR**		Iraq **OR**		psychological well-being **OR**
family **OR**		expecting **OR**		Jordan **OR**		mental well-being **OR**
intimate partner violence **OR**		mother **OR**		KSA **OR**		mental illness)
domestic violence **OR**		pregnant **OR**		Kuwait **OR**		
domestic abuse **OR**		gravidity **OR**		Lebanon **OR**		
partner **OR**		antenatal **OR**		Libya **OR**		
husband **OR**		labor **OR**		Mauritania **OR**		
spous* **OR**		birth **OR**		Morocco **OR**		
wife abuse **OR**		childbirth **OR**		Oman **OR**		
spouse violence **OR**		matern* **OR**		Qatar **OR**		
spousal violence **OR**		neonatal **OR**		“Saudi Arabia” **OR**		
spouse abuse **OR**		fetal **OR**		Somalia **OR**		
wife beating **OR**		delivery **OR**		Sudan **OR**		
intimate terrorism **OR**		“child bearing” **OR**		Syria **OR**		
sexual violence **OR**		parturient **OR**		Tunisia **OR**		
sexual abuse)		“obstetric care” **OR**		UAE **OR**		
		“cesarean section” **OR**		“United Arab Emirates” **OR**		
		“with child” **OR**		“West Bank” **OR**		
		enceinte **OR**		Gaza **OR**		
		impregnate **OR**		Palestine **OR**		
		Parity)		Yemen **OR**		
				“Middle East” **OR**		
				“Arab World” **OR**		
				“MENA” **OR**		
				“Middle East and North Africa” **OR**		
				“North Africa”)		

Figure 3. Article identification procedure

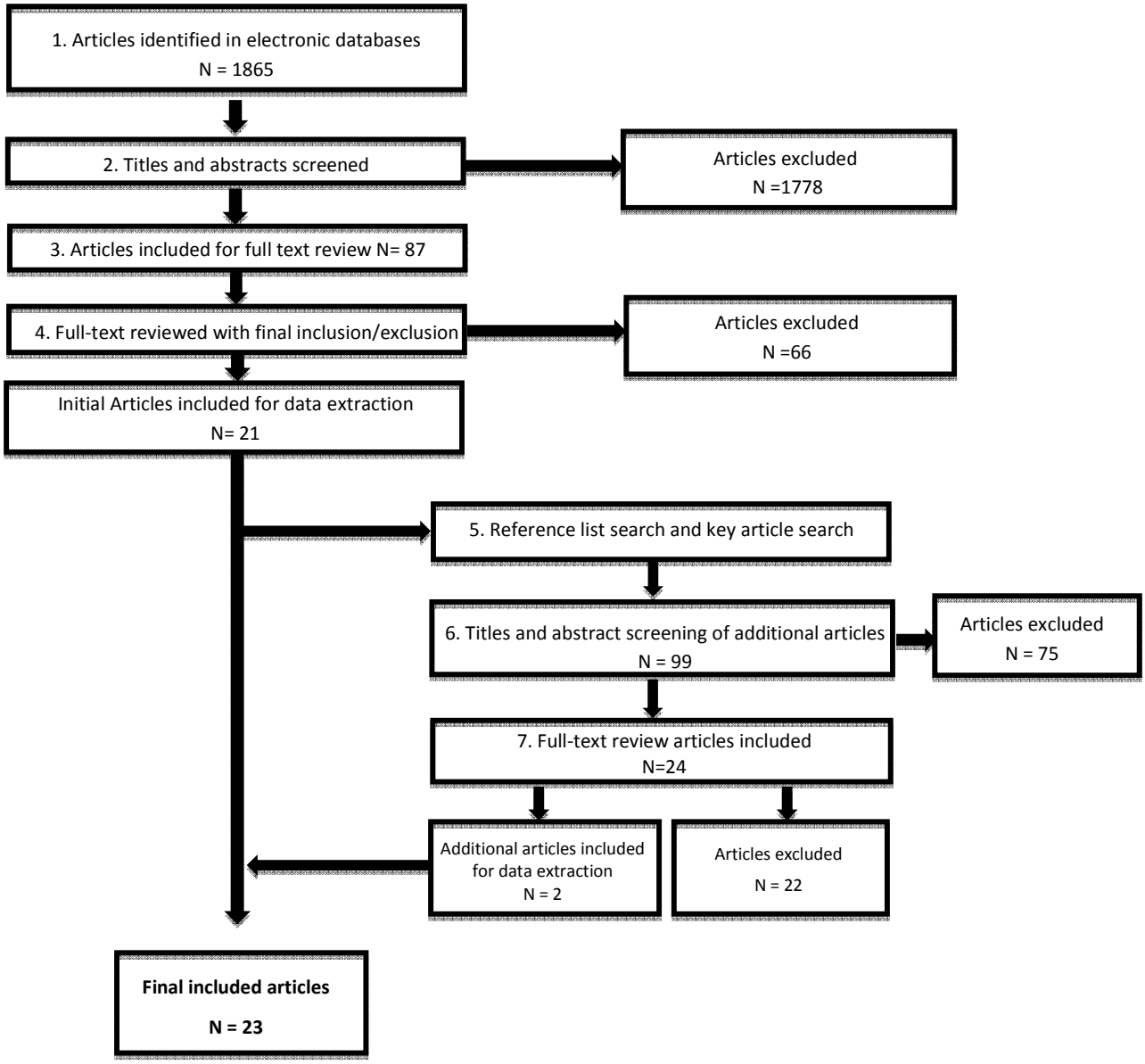

Table 1 Inclusion and exclusion criteria (N=23)

Criteria	Included	Excluded	Rationale
Study design	Quantitative (Observational & experimental)	Qualitative	Limited studies are available on this topic, and thus the incorporation of different quantitative study designs (cohort, cross-sectional, experimental, etc) helps provide a holistic view of the issue at hand.
Sampling method	Probability and non-probability sampling	None	The population of interest is pregnant women. It is likely that many studies recruited their sample in a clinical setting that offers prenatal care. These kinds of facility-based studies often rely on convenient sampling.
Analysis	Quantitative analysis	Univariate analysis, Qualitative analysis	To achieve the review's objective of understanding the relationship between empowerment social resources and perinatal mental health, bivariate analysis is needed at minimum.
Date	All dates were included	None	Studies based in any time period would contribute to the objectives of this study. Given the limited research available on mental health among pregnant women within the geographic region of interest, articles were not excluded based on the date of publication.
Geographic region	Arab World (as defined by the Arab League and World Bank)	Non-Arab countries; Arab populations outside Arab countries (e.g. refugees)	There is scarce literature on perinatal mental health in Arab countries. Non-Arab women were excluded as their cultural environment may be different from that of their Arab counterparts.
Population of interest	Arab women in the prenatal or postnatal period (up to one year after birth).	Women more than one year after birth or with serious pregnancy complications	The period of time specified represents the focus of interest for the purpose of the review.
Outcome variable	Mental and psychological health or well-being; depression; anxiety; stress	Psychopathology and/or psychiatric disorders	This review is concerned with common mental health problems/stressors that are not classified as "abnormal" by the Diagnostic Statistical Manual of Psychiatric disorders (DSM), and symptoms that have not progressed to mental disorders (e.g. we are looking at depressive symptoms not clinical depression).
Exposure variable	Social resources of empowerment (or disempowerment; e.g. domestic violence)	Studies that included empowerment solely as economic resources, human resources or agency	The definition of the social resources of empowerment used in this review is based on Kabeer's (1999) framework. Different terms were used to describe these analogous constructs (e.g. social support, family support).
Language	Arabic, English and French	All other languages unless translation was provided	Majority of the published literature in this field is in English. Some studies conducted in Tunisia, Morocco and Lebanon were published in French journals so French-speaking authors reviewed these articles.
Peer reviewed	Peer reviewed	Non-peer reviewed	The use of peer-reviewed articles reflects this review's focus on using the highest-quality research to examine the association between empowerment and perinatal mental health.

Table 2. Characteristics of included studies (N=23)

Citation	Study design	Sample Method (of participant as a unit)	Sample Size
Abdelhai & Mosleh 2015	Observational cross-sectional	Systematic sampling	376
Abou-Saleh & Ghubash 1997	Observational prospective cohort	Census of setting[1]	90
Abujilban et al. 2014	Observational cross-sectional	Convenience sampling	218
Agoub, Moussauoi & Battas 2005	Observational prospective cohort	Cannot tell[2]	144
Alasoom & Koura 2014	Observational cross-sectional	Census of setting[1]	450
Al-Azri et al. 2016	Observational cross-sectional	Cannot tell[2]	959
Al Dallal & Grant, 2012	Observational cross-sectional	Simple random sampling	237
AL Hina & Al Hina 2014	Observational prospective cohort	Cannot tell[2]	282
Alami, Kadri & Berrada 2006	Observational prospective cohort	Census of setting[1]	100
Bener et al. 2012	Observational cross- sectional	Systematic random sampling	1379
Bener, Gerber & Sheikh 2012	Observational cross-sectional	Systematic random sampling	1659
Chaaya et al. 2002	Observational prospective cohort	Census of setting[1]	396
El-Hachem et al. 2014	Observational prospective cohort	Cannot tell[2]	149
Ghubash & Abou-Saleh 1997	Observational prospective cohort	Census of setting[1]	95
Green, Broome & Mirabella 2006	Observational prospective cohort	Census of setting[1]	3 months: 86 6 months: 56
Lteif, Kesrouani & Richa 2005	Observational cross- sectional	Census of setting[1]	79
Masmoudi et al. 2008	Observational prospective cohort	Census of setting[1]	2-5 days: 213 6 to 8 weeks: 136
Masmoudi et al. 2010	Observational cross-sectional	Census of setting[1]	213
Masmoudi et al. 2014	Observational prospective cohort	Census of setting[1]	2-5 days: 302 6-10 weeks: 139
Mohammad, Gamble & Creedy 2011	Observational cross-sectional	Cannot tell[2]	353
Nayak & Al-Yattama 1999	Observational cross-sectional	Census of setting[1]	248
Osman et al. 2014	Randomized controlled trial (Single blinded)	Census of setting[1]	452
Yehia et al. 2013	Observational cross-sectional	Convenience sampling	300

1 Census at setting: census of the women at the clinic/hospital

2 Cannot tell: Not reported or unclear

Table 3. Assessment of bias and STROBE score of included studies (N=23)

Citation	Selection Bias	Exposure Assessment Bias	Outcome Assessment Bias	Confounding Bias	Attrition Bias	Overall Bias	STROBE Score
Abdelhai & Mosleh 2015	Moderate	Low	Low	Moderate	Low	Low	Medium - 16
Abou-Saleh & Ghubash 1997	Moderate	Moderate	Low	Cannot tell[1]	Low	Moderate	Medium - 16
Abujilban et al. 2014	High	Moderate	Low	Low	Cannot tell[1]	Moderate	Medium - 15
Agoub, Moussauoi & Battas 2005	Moderate	Moderate	Low	high	Low	Moderate	Low - 12
Alasoom & Koura 2014	Moderate	Moderate	Low	Low	Cannot tell[1]	Moderate	Low - 14
Al-Azri et al. 2016	Moderate	Low	Low	Moderate	Low	Low	Medium - 16
Al Dallal & Grant, 2012	Low	Low	Low	Moderate	Low	Low	Low - 14
AL Hina & Al Hina 2014	High	High	Moderate	Moderate	Cannot tell[1]	High	Low - 12
Alami, Kadri & Berrada 2006	Low	Moderate	Low	High	Moderate	Moderate	Low - 10
Bener et al. 2012	Low	Low	Low	Moderate	Moderate	Low	Medium - 15
Bener, Gerber & Sheikh 2012	Low	Low	Low	Low	High	Moderate	Medium - 16
Chaaya et al. 2002	Moderate	Low	Low	Low	Moderate	Low	Medium - 15
El-Hachem et al. 2014	High	High	Low	Low	Low	Moderate	Medium - 16
Ghubash & Abou-Saleh 1997	Moderate	Moderate	Low	Low	High	Moderate	Low - 14
Green, Broome & Mirabella 2006	Moderate	Moderate	Low	High	Moderate	Moderate	Medium - 15
Lteif, Kesrouani & Richa 2005	Moderate	Moderate	Moderate	High	Low	Moderate	Low - 14
Masmoudi et al. 2008	Moderate	Moderate	Low	High	Moderate	Moderate	Medium - 15
Masmoudi et al. 2010	Moderate	High	Low	Moderate	Low	Moderate	Medium - 15
Masmoudi et al. 2014	Moderate	Moderate	Low	High	Moderate	Moderate	Low - 12
Mohammad, Gamble & Creedy 2011	Moderate	Low	Low	Low	High	Moderate	Medium - 17
Nayak & Al-Yattama 1999	Low	Low	Moderate	Moderate	Moderate	Moderate	High - 18
Osman et al. 2014	Low	Low	Low	Low	Moderate	Low	High - 21
Yehia et al. 2013	High	Low	Low	Low	Cannot tell	Moderate	Medium - 17

1 Cannot tell: Not reported or unclear

Table 4. The association between pregnant women's social resources and mental health outcomes in the Arab World, by type of social resources (familial or general[1]) and level of overall study bias (n=7)

	Empowerment metric measured	Health Outcome	Type of analysis	Study Outcome	Summary of relationship	Country	First Author, year
Familial Social Resource – Spouse	Marital conflict	Depression	Multivariate logistic regression	OR = 13.83 p = 0.000	Marital conflict is a significant predictor of prenatal depression.[L]	Oman	Al-Azri[29] 2016
	Spouse (domestic violence)	Anxiety and depression	Binary logistic regression	OR = 3.27, p = 0.013	Domestic violence is an independent predictor of prenatal depression and anxiety combined.[L]	Egypt	Abdelhai[28] 2015
	Poor relationship with partner	Depression	Bivariate, ANOVA[2]	64.2% case, 21.6% non-case p < 0.001	Poorer relationship with spouse is significantly associated with prenatal depression.[M]	Morocco	Alami[26] 2006
	Marital problems	Depression	Bivariate Logistic regression	OR not reported p = 0.018	Marital problems, poor husband support, poor quality of sexual relationship prior to pregnancy and decreased desire of the husband are significantly associated with prenatal depression Poor quality of sexual relationship during pregnancy is not significantly associated with prenatal depression.[M]	Lebanon	Lteif[27] 2005
	Poor husband support			OR = 10.4 p = 0.001			
	Poor quality of sexual relationship before pregnancy			OR = 13.3 p = 0.001			
	Poor quality of sexual relationship during pregnancy			OR not reported p > 0.05			
	Decreased desire of the husband			OR = 6.9 p = 0.002			
	Marital conflict	Depression	Analysis of covariance	F = 0.34 p = 0.647	Marital conflict is not significantly associated with prenatal depression.[M]	Kuwait	Nayak[30] 1999
	Difficult marital relationship	Depression	Stepwise multiple regression	B= not reported, p > 0.05	Difficult marital relationship is not a significant predictor of prenatal depression.[M]	Jordan	Mohammad [23] 2011

Familial Social Resource-mother-in-law	Relationship with mother-in-law	Depression	Stepwise multiple regression	B= - 0.184, p < 0.001	Relationship with mother-in-law is a significant predictor of prenatal depression.[M]	Jordan	Mohammad [23] 2011
Familial Social Resources-general	Problematic familial relationships	Anxiety and depression	binary logistic regression	OR = 2.02 p = 0.08	Problematic familial relationships are not significant predictors of prenatal depression and anxiety combined.[L]	Egypt	Abdelhai[28] 2015
	Family support	Depression	Bivariate Logistic regression	OR not reported p > 0.05	Poor family support is not significantly associated with prenatal depression.[M]	Lebanon	Lteif[27] 2005
General[1] Social Resources	Family and non-family stressful relationship - DUCOS[3]	Depression	Multiple regression	B= 0.08 p < 0.01	Family and Nonfamily stressful relationships are significant predictors of prenatal depression, however social support from family and non-family resources was not associated with decreased prenatal depression.[M]	Jordan	Abujilban[22] 2014
	Family and non-family social support - DUCOS[3]			B= not reported, p > 0.05			
	Family and non-family - Assault history	Depression	Analysis of covariance	F = 11.58 p < 0.001	Past assault history (familial or non-familial) is significantly associated with prenatal depression.[M]	Kuwait	Nayak[30] 1999
	Family and non-family –MSSS[4] score	Depression	Stepwise multiple regression	B= not reported, p > 0.05	Poor social support is not a significant predictor of prenatal depression.[M]	Jordan	Mohammad [23] 2011

[1] General social resources are combined familial and extra-familial social resources, [2]ANOVA (Analysis of Variance), [3]DUCOS (Duke Social Support and Stress Scale), [4]MSSS (Maternity Social Support Score), [L] Overall bias of study is low, [M] Overall bias of study is moderate

Table 5. The association between postpartum women's social resources and mental health outcomes in the Arab World, by type of social resources (familial, extra-familial or general[1]) and level of overall study bias (n=18)

Type of Social Resource	Social Resource Metric Measured	Health Outcome	Type of Analysis	Study Outcome	Summary of Relationship	Country	First Author, year
Familial Social Resource – Spouse	Non-supportive husband	Depression	Multiple logistic regression	OR 2.41 P= 0.01	Non-supportive husband is a significant predictor of PPD[3].[L]	Bahrain	Al Dallal [33] 2012
	Dissatisfaction in married life	Depression	Multivariate logistic regression	OR = 1.26 p = 0.005	Dissatisfaction in married life is a significant predictor of PPD[1] Poor marital relationship is a significant predictor of PPD[3].[L]	Qatar	Bener[34] 2012
	Poor marital relationship			OR = 1.13 p = 0.048			
	Poor marital relationship	Depression	Bivariate, ANOVA[2]	33.3 % case, 13.6% non-case p = 0.02	Poor marital relationship is significantly associated with PPD[3].[M]	Morocco	Agoub[39] 2005
	Poor relationship with partner	Depression	Bivariate, ANOVA[2]	14.2% case, 22.6% non-case p < 0.001	Poor relationship with spouse significantly associated with PPD[3].[M]	Morocco	Alami[26] 2006
	Marital relationship	Depression	Bivariate, Chi-square	Good: 73.52% case, 11.02% non-case Bad: 13.23% case, 2.2% non-case p = 0.034	Poor quality of marital relationship is significantly associated with PPD[3].[M]	Tunisia	Masmoudi [40] 2008
	AZRIN[4] score	Depression	Bivariate, Chi-square	p = 0.034	Lower quality of marital relationship is significantly associated with PPD[3].[M]	Tunisia	Masmoudi[24] 2014
	Difficult marital relationship	Depression	Bivariate, Chi-square	At 6-8 weeks: X^2 = 13.41, p= 0.009 At 6 months: X^2 = 15.867, p= 0.003	Difficult marital relationship is significantly associated with PPD[3].[M]	Jordan	Mohammad[23] 2011
	Poor relationship with husband	Depression	Bivariate, Chi-square	p = n.s.	Relationship with husband is not significantly associated with PPD[3].[M]	UAE	Green[14] 2006
	Marital problems before birth	Depression	Bivariate, contingency tables	Yes: 5 case, 2 non-case No: 10 case, 69 non-case p = 0.001	Marital problems (before birth and ongoing) are significantly positively associated with PPD[3] Husband assistance is significantly inversely associated with PPD[3].[M]	UAE	Abou-Saleh[12] 1997
	Ongoing marital problems			Yes: 5 case, 9 non-case No: 10 case, 63 non-case			

				p = 0.05			
	Husband assistance			Yes: 9 case, 55 non-case No: 7 case, 18 non-case p = 0.05			
	Marital problems before birth	Depression	DFA[5]	p < 0.0001	Marital problems are a significant predictor of PPD[3].[M]	UAE	Ghubash [31] 1997
	Non-supportive husband	Depression	Stepwise Logistic regression	OR 2.493 P= 0.011	Non-supportive husband is a significant independent predictor of PPD[3].[M]	Saudi Arabia	Alasoom[32] 2014
	Dissatisfaction in married life	Anxiety	Multivariate logistic regression	OR = 1.6 p = 0.02	Dissatisfaction in married life is a significant predictor of postpartum anxiety and stress. It is not a significant predictor of PPD[3].[M]	Qatar	Bener[21] 2012
		Stress		OR = 1.9 p = 0.006			
		Depression		OR = not reported p > 0.05			
	Poor Quality of marital relationship	Depression	Multivariate logistic regression	OR = 3.806, p = 0.009	Poor Quality of marital relationship is a significant predictor of PPD[3].[M]	Tunisia	Masmoudi[56] 2010
Familial Social Resource - mother	Help provided by mother	Depression	Bivariate, Chi square	OR = 1.33 p = 0.292	Less Help provided by mother is not significantly associated with PPD[3].[L]	Bahrain	Al Dallal [33] 2012
	Relationship with own mother	Depression	Bivariate, Chi square	p = n.s.	Relationship with own mother is not significantly associated with PPD[3].[M]	UAE	Green[14] 2006
Familial Social Resource – mother-in-law	Relationship with mother-in-law	Depression	Bivariate, Chi-square	Good: 29.6% case, 43% non-case Bad: 70.4% case, 57% non-case P<0.001	A bad relationship with mother-in-law is significantly associated with PPD[1].[L]	Qatar	Bener [34] 2012
	Relationship with mother-in-law	Depression	Bivariate	At 3 months: [x2 (1, n=52)=5.40 p=0.02 At 6 months: p=n.s.	Relationship with mother-in-law is significantly associated with PPD[3] (at 3 months, but not at 6 months).[M]	UAE	Green [14] 2006

	Difficult relationship with mother-in-law	Depression	Stepwise multiple regression	B = - 0.194 p < 0.001	Difficult relationship with mother-in-law is a significant predictor of PPD[3].[M]	Jordan	Mohammad[23] 2011
	Relationship with mother-in-law	Depression	Multivariate logistic regression	OR = not reported p > 0.05	Relationship with mother-in-law is not a significant predictor of PPD[3], anxiety or stress.[M]	Qatar	Bener[21] 2012
		Anxiety		OR = not reported p > 0.05			
		Stress		OR = not reported p > 0.05			
Familial Social Resource – General	Satisfied with help at home	Depression	Bivariate	OR = 2.00 p = 0.04	Less satisfaction with help at home is significantly associated with increased PPD[3].[L]	Bahrain	Al Dallal [33] 2012
	Poor family support	Depression	Multivariate logistic regression	OR = 1.52 p = 0.016	Poor family support is a significant predictor of PPD[3].[L]	Qatar	Bener[34] 2012
	Family support	Depression	Stepwise multiple regression	OR = not reported p > 0.05	Lack of family support is not a significant predictor of PPD[3].[M]	Lebanon	El-Hachem[37] 2014
	Staying with women's family (not in-laws)	Depression	DFA[5]	p < 0.001	Decreased family support is a significant predictor of PPD[3].[M]	UAE	Abou-Saleh [12] 1997
	Non-supportive relatives	Depression	Stepwise Logistic regression	OR Not reported p> 0.005	Poor support from relatives is not a significant predictor of PPD[3].[M]	Saudi Arabia	Alasoom[32] 2014
	Lack of family support	Depression	Multivariate logistic regression	OR = 1.6 p = 0.005	Poor family support is a significant predictor of PPD[3] and anxiety. It is not a significant predictor of stress.[M]	Qatar	Bener[21] 2012
		Anxiety		OR = 1.9 p < 0.001			
		Stress		OR Not reported p> 0.005			
	Lack of Social and family support	Depression	Multivariate logistic regression	OR = 2.265, p = 0.071	Poor family support is a significant predictor of PPD[3].[M]	Tunisia	Masmoudi[56] 2010

	MDPSS-Fa[5] score	Depression	Multiple Hierarchical regression	B = -0.13, p = 0.007	Poor family social support is a significant predictor of PPD[3].[M]	Jordan	Yehia [25] 2013
	Conflict with a family member	Depression	binomial regression	At 2 weeks: OR=1.7, p=0.017 At 8 weeks: OR=1.468, p=0.229	Conflict with a family member is a significant predictor of PPD[3] (at 2 weeks, but not at 8 weeks).[H]	Oman	AL Hina[36] 2014
Extra-Familial Social Resource	Postpartum support film alone	Stress	Bivariate, t-test	Treatment (15.76 ± 6.55) vs control group (18.93 ± 7.03) p < 0.01	Increased social support is significantly associated with lower postpartum stress.[L]	Lebanon	Osman [38] 2014
	Postpartum support film with hotline service			Treatment (15.86 ± 6.81) vs control group (18.9z3 ± 7.03) p < 0.01			
	Hotline service alone			Treatment (16.98 ± 6.42) vs control group (18.93 ± 7.03) p < 0.05			
	Social support (more than one confidant)	Depression	Multiple Logistic regression	OR = 0.66 p > 0.05	Poor social support is not a significant predictor of PPD[3].[L]	Lebanon	Chaaya[13] 2002
	MDPSS-Fr[6] score	Depression	Multiple hierarchical regression	B= not reported, p > 0.05	Poor friends and others social support is not a significant predictor of PPD[3].[M]	Jordan	Yehia [25] 2013
	MDPSS-Oth[7] score			B= not reported, p > 0.05			
General[1] Social Resource	MSSS[8] score	Depression	Bivariate, Chi-square	p = 0.29	Poor social support is not significantly associated with PPD[3].[M]	Tunisia	Masmoudi[24] 2014
	MSSS[8] score	Depression	Stepwise multiple regression	B = - 0. 0.123 p = 0.003	Poor social support score is a significant predictor of PPD[3].[M]	Jordan	Mohammad[23] 2011

[1]General social resources are combined familial and extra-familial social resources, [2]ANOVA (Analysis of variance), [3]PPD (Postpartum Depression), [4]AZRIN (Marital relationship scale), [5] DFA (Discriminant Function Analysis), [5]MDPSS-Fa (Multidimensional Perception of Family Social Support), [6]MDPSS-Fr (Multidimensional Perception of Friends Social Support), [7]MDPSS-Oth (Multidimensional Perception of Others Social Support), [8]MSSS (Maternity Social Support Score) [L] Overall bias of study is low, [M] Overall bias of study is moderate, [H] Overall bias of study is high