

# Perinatal Depressive Symptoms Among Arab Women in Northern Israel

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**Abstract** Perinatal depression, a prevalent condition with negative consequences for the mother, infant and family, has been reported in many countries. This study aimed to assess the scope of depressive symptoms among pregnant and postnatal Israeli Arab women and to identify possible risk factors. Data were collected from a screening program at 58 Mother–Child Health Care clinics in northern Israel from June to December, 2009. Participants included 1,254 pregnant and 2,326 postnatal women. The rate of antenatal depressive symptoms, i.e., a score of  $\geq 10$  on the Edinburgh Postnatal Depression Scale (EPDS) was 20.8%. Women attending clinics with primarily religious or traditional populations had lower rates antenatally than did those

described as secular. During the postnatal period 16.3% of the women scored  $\geq 10$  on the EPDS. The rate of postnatal depressive symptoms was significantly higher among women living in Moslem than Druze communities (EPDS  $\geq 10$ : 19.0% vs. 13.4%, respectively,  $P = 0.01$ ). Postnatally, there were no significant differences according to SES cluster, community size, or religious orientation. The rate of antenatal and postnatal depression among Arab women in northern Israel was somewhat higher than that of Jewish Israeli women in the same region, and considerably lower than that of Arab Bedouin women in southern Israel. Given the differences in their life styles and circumstances, health policy authorities should be informed regarding the needs of these various sub-populations.

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## Introduction

Perinatal mood and anxiety disorders, particularly postnatal depression (PND) are perhaps the most common complications of pregnancy and the postnatal period [1, 2]. A PND prevalence rate of 10–20% has been reported in many countries and cultures [1, 3–6] including in Israel [7–10], making identification and treatment a public health priority [11, 12]. Indeed, PND has been described by Goldbort [5] as ‘a universal experience, although labeled variously in different cultures.’

Israel, with a population of about 7,750,000 [13] is a multi-cultural society, with a majority Jewish population and a large Arab minority. Israel’s multi-faceted Arab population comprises nearly 20% of its citizens. While the majority is Moslem, within this group there are varying

life-styles, from city- and village-dwellers in the north, to southern Bedouin who live in encampments or unrecognized townships. Polygamy is not uncommon among this latter group [14, 15]. In comparison to the Jewish majority, the Arabs tend to have a more collective society with lower levels of education, income and employment. They tend to marry at an earlier age and have higher birthrates [13, 16]. The Druze community in Northern Israel is a sub-group of the Arab population. Their culture and language is Arabic, but their religion is distinctly monotheistic. Since the founding of the State of Israel in 1948, they have chosen a more mainstream lifestyle, leaning away from Arab nationalism and participating more in the majority society, typified by their service in the Israel Defense Forces [17].

Israeli research on PND has dealt primarily with the Jewish population, but less is known regarding Arab women. Given the differences in lifestyles and their potential impact on childbearing women, it is not clear that PND findings regarding the majority Jewish group, and their implications for health policy, are applicable to Arab populations. Several studies on PND have been conducted in other Arab-speaking countries [18–25] as well as one among Israeli Bedouin women [26]. However there is little data on non-Bedouin women who comprise the majority of Arabs in Israel. Mental health research in Israel has repeatedly pointed to higher rates of depression among Arabs than Jews [27, 28]. Public health services are responsible for pre- and postnatal care of women in all sectors. Therefore, it would be important for planning perinatal health care to consider whether Arab women display significantly more depressive symptoms than do Jewish women in this period.

The aim of the present study was to assess the scope of perinatal depressive symptoms among the Israeli Arab population and to identify associations with selected factors.

## Method

### Setting

The Israel Ministry of Health maintains a universal service of Mother–Child Health Care (MCHC) clinics that are attended by a large majority of women [29]. They provide preventive care for pregnant and postnatal women and children up to the age of 5 years. These clinics are located throughout the country, in large cities as well as small villages, in the Jewish and Arab sectors, and provide services at nominal cost. In 1999 the Ministry decided to promote screening for depressive symptoms among pregnant and postnatal women attending these clinics [30]. In 2008 the program was instituted in the Acre sub-district

that serves the Arab population in the Galilee region of Northern Israel. The current report analyzes data collected in these clinics.

### Participants

The study population included women attending government MCHC clinics in the Arab sector of the Acre sub-district (population 555,400), in northern Israel for antenatal or postnatal care during the months June through December, 2009. As part of the routine ante- and postnatal care, MCHC nurses request that all women receiving this care complete the EPDS during their visits at about the 26th week of pregnancy and 6 weeks postnatally. The questionnaires are reviewed and discussed with each woman, and the Ministry's intervention guidelines are followed as necessary. Of the 65 clinics in the sub-district, five in which a majority of the attendees were Jewish women, and two clinics in small Bedouin encampments, were excluded from the analysis. In the 58 remaining clinics, located in 34 communities (range 1–5 clinics/community), all pregnant and postnatal women were eligible for inclusion, with no other exclusion criteria. During the study period, 1,254 pregnant and 2,326 postnatal women completed the screening in these clinics.

Since the current analysis was conducted on data collected in-service, rather than as prospective research, there was no systematic recording of the number of potential participants who did not complete the EPDS antenatally or postnatally. In order to better understand the potential impact of this absent data, clinics were rated by the sub-district nurse (M.T.) regarding their degree of compliance with the screening procedures. Clinics were rated 'excellent,' 'good,' 'fair,' or 'poor.' Nearly three-quarters of the clinics in this study (73.9%) were considered to have excellent or good compliance. Comparison of scores did not indicate significant differences in rates of antenatal or postnatal depressive symptoms as a function of the degree of compliance.

### Study Instrument

Depressive symptoms were assessed using the Arabic translation of the Edinburgh Postnatal Depression Scale (EPDS), a ten-question self-report questionnaire, with scores ranging from 0 to 30 [31]. A score of  $\geq 10$  reflects at least a mild depressive episode and a score of  $\geq 13$  reflects moderate to severe depressive symptoms [32]. Ghubash et al. [33] validated the Arabic version of the EPDS and reported a sensitivity of 91% (specificity of 84%) at a cut-off score of 10, and sensitivity of 73% (specificity 90%) at cut-off score of 13. Question 10 on the EPDS asks about thoughts of self-harm, and any positive score is considered

cause for concern, even if the overall EPDS score is low. The EPDS has also been validated for use during pregnancy [32, 34]. The Israeli Ministry of Health has recommended a cut-off score of  $\geq 10$  for use as a first-stage screening measure.

#### Data Collection

MCHC nurses recorded the number of women completing the EPDS and their scores (grouped by 0–9; 10–12;  $\geq 13$ ), as well as the number of women who answered Question 10 in the affirmative, and summarized them on monthly reports submitted to the sub-district office. Data were collected from these hand-written reports. Information regarding each specific clinic enabled designation of socio-demographic characteristics of the community or clinic population, as described below.

Socio-economic status (SES) was defined according to the Israel Central Bureau of Statistics (ICBS) rating of communities according to ‘Clusters,’ on a scale of 1–10, with Cluster 1 indicating the lowest status [13]. The communities included in this study were in the 2–4 range, with only ten women (from one community) in SES Cluster 6.

In order to assess whether community characteristics, as indicated by population size, might reflect aspects of social cohesion, social pressures, and/or social support which could impact women’s emotional condition following childbirth, communities were grouped according to the number of residents and ICBS categories [13] were assigned as follows: <5,000; 5,000–9,999; 10,000–19,999;  $\geq 20,000$ . This grouping reflects the continuum of rural-to-urban residence.

The composition of the study population enabled consideration of possible differences in depression rates among the major ethnic sub-groups. As is common throughout Israel, many of the communities in the study sub-district were of homogeneous populations based on ethnic-religious affiliation, with over half of the study group (52.2%) living in communities with at least 90% Moslem or Druze residents [13]. Thus, for the specific analysis of ethnic trends, only clinics in these homogeneous communities were included. Homogeneous Christian communities were excluded, since they provided only 41 participants.

Religious orientation is considered an important aspect of Israeli life; however information regarding the degree of religiosity (i.e., adherence to religious practices) of clinic populations was not available from the ICBS. Therefore this information was provided by the Ministry of Health sub-district nurse, who is intimately familiar with the populations of each clinic and community. This variable was categorized as ‘secular,’ ‘traditional’ or ‘religious.’

#### Data Analysis

Monthly aggregate reports were provided by the sub-district administration. The data were entered onto an Excel spreadsheet and converted to a SAS file. For analysis, transpose manipulation was done to reflect the number of cases per clinic in each report at each period (pregnancy/postpartum) and at each level of EPDS scores (0–9; 10–12; 13+). Analysis was done using the weighted option (weight by the ‘number of cases’ variable). Socio-demographic features ascribed to each clinic were merged with the corresponding records. Analyses were conducted using the SAS 9.2 Version [35] on UNIX server, and a logic check program was designed for data cleaning. Discrete variables were analyzed by chi square analysis or phi coefficient (for ordered variables), with a *P* value of 0.05 considered significant.

#### Ethical Considerations

The study was approved by the IRB of Sheba Medical Center, Ramat Gan, Israel.

#### Results

Participants included 3,580 (1,254 pregnant and 2,326 postnatal) women attending 58 MCHC clinics in the Acre-Western Galilee Sub-District of the Ministry of Health. Nearly three-quarters of the clinics (74.1%) were in communities with a Moslem majority [13], with the remainder in communities with a Druze or Christian majority (19.0 and 6.9%, respectively).

The rate of antenatal depressive symptoms, as determined by a score of  $\geq 10$  on the EPDS was 20.8%, with over half of these (12.7%) scoring in the  $\geq 13$  range (Table 1). Twenty women (1.1%) responded in the affirmative to Question 10, regarding thoughts of self-harm. The rate of EPDS scores  $\geq 10$  was significantly lower among women in communities in SES Cluster 3 (16.3%) than among those residing in communities rated in both the lower and higher clusters (Cluster 2: 22.4%; Cluster 4: 25.8%; *P* = 0.02). When EPDS scores are analyzed as three groups (0–9; 10–12;  $\geq 13$ ), as presented in Table 1, the result is similar, with a slightly higher *P* value (0.05). Women living in smallest and largest size communities had significantly lower rates of depressive symptoms than did those in the mid-size communities (EPDS  $\geq 10$ : 15.7% and 16.6% vs. 29.2% and 22.0%, respectively, *P* < 0.001). An association was also found between the degree of religiosity and depressive symptoms. Women attending clinics with primarily religious or traditional populations had lower rates of depressive symptoms than did those

**Table 1** Antenatal depressive symptoms among Arab women in northern Israel by community characteristics

Characteristic	EPDS Score: <i>n</i> (%)					<i>P</i> *
	<i>N</i>	%	0–9	10–12	≥13	
Total	1,254	100.0	993 (79.2)	102 (8.1)	159 (12.7)	
SES <sup>a</sup>						0.05
Cluster 2	545	43.5	423 (77.6)	48 (8.8)	74 (13.6)	
Cluster 3	469	37.4	392 (83.6)	27 (5.6)	50 (10.7)	
Cluster 4	240	19.1	178 (74.2)	27 (11.2)	35 (14.6)	
Population size <sup>a</sup>						0.001
<5,000	216	17.2	182 (84.3)	18 (8.3)	16 (7.4)	
5,000–9,999	250	19.9	177 (70.8)	28 (11.2)	45 (18.0)	
10,000–19,999	433	34.5	338 (78.1)	38 (8.8)	57 (13.2)	
≥20,000	355	28.3	296 (83.4)	18 (5.1)	41 (11.5)	
Religiosity <sup>b</sup>						0.006
Secular	78	6.4	49 (62.8)	10 (12.8)	19 (24.4)	
Traditional	632	52.1	501 (79.3)	54 (8.5)	77 (12.2)	
Religious	503	41.5	406 (80.7)	34 (6.8)	63 (12.5)	
Ethnic sub-group <sup>c</sup>						NS
Moslem	332	53.0	256 (77.1)	32 (9.6)	44 (13.2)	
Druze	294	47.0	232 (78.9)	26 (8.8)	36 (12.2)	

\* *P* values for EPDS score breakdown of 0–9 and ≥10 are presented in the text

<sup>a</sup> Based on Israel Central Bureau of Statistics [13]

<sup>b</sup> Based on population attending specific clinics, as per sub-district nurse; not including missing values

<sup>c</sup> Based on communities with ≥90% of the population belonging to the group [13]

described as secular (EPDS ≥ 10: 19.3% and 20.7% vs. 37.2%, respectively, *P* = 0.001). A similar trend was found for EPDS scores ≥ 13 (*P* = 0.006). No significant difference was found in the rate of EPDS ≥ 10 or ≥ 13 between women residing in primarily Moslem or Druze communities.

During the postnatal period 16.3% of the women scored ≥ 10 on the EPDS, with half of these (8.0%) scoring ≥ 13 (Table 2). Forty-eight women (1.1%) responded affirmatively to Question 10. There were no significant differences in the rates of depressive symptoms among the SES clusters or among communities of varying population size, or religious orientation of the clinic attendees (although the latter displayed a trend toward higher rates among secular populations). Comparing women living in homogeneous Moslem and Druze communities, the rate of postnatal depressive symptoms was significantly higher among the former, considering EPDS both in the ≥10 and ≥13 ranges (19.0% vs. 13.4%, respectively *P* = 0.01 and 9.8% vs. 5.0%, *P* = 0.01).

In order to shed light on possible differences between the major sub-groups in the study population, analysis was conducted on clinics in communities of at least 90% Moslem (*n* = 332) or Druze (*n* = 294) populace (Table 3). No significant differences in antenatal rates of EPDS ≥ 10

were found between these groups based on community SES Cluster, population size, or degree of religiosity of the clinic population. However, in the postnatal period, women in the SES Cluster 3 Moslem communities had significantly higher rates than did those in the Druze communities (26.8% vs. 13.0%, respectively; *P* = 0.02). Similarly, Moslem women of traditional religious orientation had higher rates than did the traditional Druze women (21.6% vs. 11.9%; *P* = 0.002).

## Discussion

Participants in this study, Arab women living in the north-western Galilee region of Israel, were screened for depressive symptoms using the EPDS at two points: at approximately 26 weeks of pregnancy and 6 weeks postnatally. The findings indicate that during pregnancy one-fifth of the women had scores indicating at least minor depression, with over half of these indicating moderate to severe symptoms. The rate was somewhat lower in the postnatal period, with one in six women having scores indicating at least minor depression, and again half of these indicated moderate to severe symptoms. Indeed, in a study in Thailand, Limlongwonse and Liabsuetrakul [36] reported nearly

**Table 2** Postnatal depressive symptoms among Arab women in northern Israel by community characteristics

Characteristic	EPDS score: <i>n</i> (%)					<i>P</i> *
	<i>N</i>	%	0–9	10–12	≥13	
Total	2,326	100.0	1,948 (83.7)	192 (8.3)	186 (8.0)	
SES <sup>a</sup>						NS
Cluster 2	1,323	56.9	1,102 (83.3)	108 (8.2)	113 (8.5)	
Cluster 3	628	27.0	523 (83.3)	55 (8.8)	50 (8.0)	
Cluster 4	375	16.1	323 (86.1)	29 (7.7)	23 (6.1)	
Population size <sup>a</sup>						NS
<5,000	332	14.3	283 (85.2)	19 (5.7)	30 (9.0)	
5,000–9,999	623	26.8	517 (83.0)	62 (10.0)	44 (7.1)	
10,000–19,999	597	25.7	495 (82.9)	49 (8.2)	53 (8.9)	
≥20,000	774	33.3	63 (84.4)	62 (8.0)	59 (7.6)	
Religiosity <sup>b</sup>						0.08
Secular	57	2.5	44 (77.2)	8 (14.0)	5 (8.8)	
Traditional	1,239	54.4	1,032 (83.3)	115 (9.3)	92 (7.4)	
Religious	981	43.1	832 (84.8)	65 (6.6)	84 (8.6)	
Ethnic sub-group <sup>c</sup>						0.01
Moslem	826	66.4	669 (81.0)	76 (9.2)	81 (9.8)	
Druze	417	33.6	361 (86.6)	35 (8.4)	21 (5.0)	

\* *P* values for EPDS score breakdown of 0–9 and ≥10 are presented in the text

<sup>a</sup> Based on Israel Central Bureau of Statistics [13]

<sup>b</sup> Based on population attending specific clinics, as per sub-district nurse; not including missing values

<sup>c</sup> Based on communities with ≥90% of the population belonging to the group [13]

**Table 3** Rate of perinatal depressive symptoms among Moslem and Druze women by characteristics of community population

Characteristic	Antenatal EPDS ≥ 10			Postnatal EPDS ≥ 10		
	<i>N</i> (%)	Moslem (21 clinics) <sup>a</sup> <i>n</i> (%)	Druze (8 clinics) <sup>a</sup> <i>n</i> (%)	<i>n</i> (%)	Moslem (21 clinics) <sup>a</sup> <i>n</i> (%)	Druze (8 clinics) <sup>a</sup> <i>n</i> (%)
Total	626 (22.0)	332 (22.9)	294 (21.1)	1,243 (17.1)	826 (19.1)	417 (13.4)
SES <sup>b</sup>						
Cluster 2	309 (23.0)	309 (23.0)	0	785 (18.6)	785 (18.6)	0
Cluster 3	182 (19.2)	23 (21.7)	159 (18.9)	241 (15.3)	41 (26.8*)	200 (13.0*)
Cluster 4	135 (23.7)	0	135 (23.7)	217 (13.8)	0	217 (13.8)
Population size <sup>b</sup>						
<5,000	188 (16.0)	158 (17.1)	30 (10.0)	290 (15.5)	254 (16.1)	36 (11.1)
5,000–9,999	137 (28.5)	50 (34.0)	87 (25.3)	378 (18.0)	233 (19.3)	145 (15.9)
10,000–19,999	274 (20.8)	97 (20.6)	177 (20.1)	392 (14.8)	156 (18.6)	236 (12.3)
20,000+	27 (44.4)	27 (44.4)	0	183 (22.9)	183 (22.9)	0
Religiosity <sup>c</sup>						
Secular	0	0	0	0	0	0
Traditional	297 (21.9)	77 (27.3)	220 (20.0)	596 (16.9)	310 (21.6**)	286 (11.9**)
Religious	316 (22.5)	242 (21.9)	74 (24.3)	619 (17.0)	488 (17.0)	131 (16.7)

\* *P* = 0.02; \*\* *P* = 0.002

<sup>a</sup> Based on communities with ≥90% of the population belonging to the group [13]

<sup>b</sup> Based on Israel Central Bureau of Statistics [13]

<sup>c</sup> Based on population attending specific clinics, as per sub-district nurse; not including missing values

identical rates of ante- and postnatal depressive symptoms to those found in the present study, using the same EPDS cut-off and timing. Others have also reported lower rates of depressive symptoms postnatally than during pregnancy [9, 37].

A report of EPDS screening conducted by the Clalit Health Services, the largest HMO in Israel [38] found antenatal rates among Israeli Arab women similar to those in the present research, as did Mohammad in a study of Jordanian women [24]. These rates are somewhat higher than the 16.5% found antenatally among Jewish women in the Northern Region in the Clalit study.

Regarding postnatal data, several studies of women in Arab-speaking populations in other countries have been reported, many using the EPDS [18–21, 23–26, 39, 40]. The varying rates reported (Table 4) may be due to the differences in populations and cultures, but may also be dependent on the criterion (cut-off score), as well as differences in methodology (e.g., postnatal timing, mode of measurement, etc.) even when the same instrument is used.

Some Israeli studies using the EPDS have reported lower postnatal rates among Jewish women. Fisch et al. [10] reported 11% among women in Jerusalem, with half in the moderate-to-severe range. In a study including both Jews and Arabs, Eilat-Tsanani [8] reported 5.5% of the former with EPDS scores of  $\geq 13$ , compared to a quarter of the Arab women. Methodological differences that may explain the disparity between their findings and those of the present study include the fact that the women in

Eilat-Tsanani's study were recruited in the hospital following delivery, as compared to screening in community MCHC clinics in this study. The refusal rate for their 2-month follow-up phase was about 13%, which may indicate selection bias, e.g., women who felt well may have been less inclined to participate. In the present study refusals were reported to be negligible. It should also be noted that the number of Arab women in that study was 89, compared to over 2,000 in the postnatal phase of the present study. In recent studies of Bedouin women in the southern Negev region of Israel, Alfiomi-Ziadna [14] and Glasser et al. [26] also found much higher rates than in our study (Table 4). However, while both groups are Israeli-Arab populations, the Bedouin culture and lifestyle differ in many aspects from the northern Arabs, and the rate of Westernization apparent in Israeli life, even among the urban Arab population, has not been paralleled among the Bedouin [15, 41]. An important comparison with the participants in the present study would be with the Jewish Israeli women in the Northern Region of the Clalit study [38], in which the rate was somewhat lower than that in this study.

Despite the fact that only clinic or community aggregative data was available in the current study, an attempt was made to see if any risk factors were evident. Several indicators were apparent in the antenatal period, but not postnatally. This distinction was also reported by Leigh and Milgrom [42], who found that risk factor profiles for antenatal depression, postnatal depression and parenting

**Table 4** Prevalence of postpartum depressive symptoms among Arab-speaking populations

Source	Country (population)	N <sup>a</sup>	Postpartum timing	Measure/criterion	Rate (%)	Comment
Glasser et al. (current study)	Israel (northern area)	2,326	6 Weeks	EPDS <sup>b</sup> $\geq 10$	16.3	EPDS $\geq 13$ : 8%
Glasser et al. [26]	Israel (southern Bedouin)	104	<12 Weeks	EPDS $\geq 10$	43.0	EPDS $\geq 13$ : 26.0%
Glasser et al. [38]	Israel (northern area)	419	8 Weeks	EPDS $\geq 10$	12.2	EPDS $\geq 13$ : 4.1%
Eilat-Tsanani et al. [8]	Israel (central area)	89	8 Weeks	EPDS $\geq 13$	24.7	
Alfiomi-Ziadna [14]	Israel (southern Bedouin)	564	6 Weeks	EPDS $\geq 10$	32.0	EPDS $\geq 13$ : 17%
Mohammed [24]	Jordan	360	6–8 Weeks	EPDS $\geq 13$	22.1	
Oweiss [25]	Jordan	278	4–6 Weeks	EPDS $\geq 9$	47.0	
Green et al. [21]	United Arab Emirates	56	6 Weeks	EPDS $\geq 10$	44.2	EPDS $\geq 13$ : 22.1%
Abou-Saleh and Ghubash [18]	Dubai	95	1 Week	EPDS $\geq 12$	17.8	
			8 Weeks	PSE <sup>b</sup>	15.8	
Agoub et al. [19]	Morocco	144	2–3 Weeks	EPDS 13	20.1	
			6 Weeks	MINI <sup>b</sup>	6.9	
Chaaya et al. [20]	Lebanon	396	3–5 Months	EPDS $\geq 13$	21.0	16% in Beirut; 26% in rural area
Masmoudi et al. [23]	Tunisia	136	6 Weeks	EPDS $\geq 10$	13.2	
Matthey and Barnett [39]	Australia	98	6 Weeks	EPDS $\geq 10$	16.7	

<sup>a</sup> In studies with Arab and non-Arab populations, N refers to Arab subject group only

<sup>b</sup> Edinburgh Postnatal Depression Scale (EPDS); Present State Examination (PSE); Mini International Neuropsychiatric Interview (MINI)

stress were different, though probably interrelated. While all communities in the study fell into the lower SES clusters, women in the middle of the sample clusters had a somewhat lower rate of antenatal EPDS scores, though not in the postnatal period. Although some studies have found an inverse relationship between socioeconomic level and depressive symptoms [43–46], it is hard to explain why the difference was found here during pregnancy and not postnatally, despite the large sample sizes. Similarly curious is the fact that community size was also found related, but not directly so, to rates of depressive symptoms antenatally but not postnatally. In their Lebanese study, Chaaya et al. [20] found a higher rate of PND symptoms among women living in rural as compared to urban areas. In this study, those living in cities (defined as  $\geq 20,000$  residents) also had lower rates of EPDS scores  $\geq 10$  antenatally, but this distinction was not statistically significant in the postnatal period. Similarly Blistzta et al. [47] found a higher rate of antenatal depression in their urban group, compared to rural, but no difference in the rates postnatally.

The significant effect of religiosity also diminished from pregnancy to postnatal periods, although the trend was similar in both cases—with secular women most likely to have higher EPDS scores. This effect of religiosity was noted in a study of Israeli Jews [48], with higher rates among the secular women. A similar effect was reported by Mann et al. [49], who suggest that ‘organized religious participation appears to be protective from postnatal depressive symptoms.’

In this study a significant difference was found between Moslem and Druze women in the rate of postnatal depressive symptoms. Moslem women attending clinics with populations characterized as religiously ‘traditional’ had twice the rate of postnatal symptoms as did Druze women (none of these clinic populations was described as ‘secular’), while no difference was found among those attending clinics characterized as more strictly ‘religious.’ A similar, but non-significant trend was noted antenatally as well. This could reflect the more stringent social pressures toward religious adherence, with concurrently higher birth rates and poorer socioeconomic circumstances among the Moslem than among the Druze women.

A limitation of the present study is that while the EPDS has been translated and validated in Hebrew [50, 51], the Arabic version has not been validated on an Israeli Arab population. Ghubash et al. [33] conducted a validation study of the Arabic translation among women in Dubai and concluded that this version was reliable and valid as a screening tool for PND. It is not certain that these translations, and the corresponding cut-off scores, are valid for Israeli Arab-speakers, and a validation of the Arabic translation of the EPDS on this population is recommended.

The issue of cut-off scores is particularly important when considering different populations. For example, in Dubai, Ghubash et al. [33] selected a cut-off of  $EPDS \geq 12$ , however, Matthey and Barnett [39], working with Arab women in Australia concluded ‘...that different cut-offs will be appropriate for different ethnic communities and it would be wrong to translate the scale without also ascertaining the correct cut-off point.’ They determined that the 9/10 cut-off point for Arabic women (in Australia) was appropriate, lower than that for the Anglo-Celtic community. However, the clinical significance of higher scores should not be ignored. For example, among the Jewish women in the Clalit study [38] only one-third scored  $\geq 13$ , while among the Arab population in this study one-half scored in this range, reflecting moderate-to-severe depressive symptoms. Thus while determination of cut-off points is an important issue in guiding epidemiological research leading to policy decisions, it is necessary to take into account potential cultural factors affecting women’s openness to reporting emotional difficulties, the setting in which the screening is conducted, acceptable sensitivity and specificity levels, availability of support services, etc. Hopefully future research will contribute to this effort. Nevertheless, while not ignoring this issue as a limitation, it should be noted that Small et al. [52], studying the performance of the EPDS in non-English speaking populations (Turkish, Vietnamese & Filipino), concluded that their findings supported the use of the EPDS in cross-cultural research on PND.

Other limitations of this study are its dependence on aggregate data, both on the patient and clinic/community level, and the use of general information supplied by the sub-district nurse, particularly with regard to defining religiosity. Recognizing this limitation, which is due to the fact that it was a post-facto analysis of a large body of data accumulated in-service, it was nevertheless decided to take advantage of the information regarding this under-studied population until other studies provide information which could help to better pinpoint individuals or sub-groups at particular risk, and plan intervention tailored to them.

Despite these limitations, the rates of perinatal depressive symptom rates and trends relating to social variables are similar to those of other studies in general, and particularly in studies of Arab women in other countries (e.g., Jordan, Lebanon). Considering the possible differences between these settings that could impact results can serve to lend veracity to the strength of the current findings.

In summary, the rate of antenatal and postnatal depression among Arab women in northern Israel has been found to be somewhat higher than that of Jewish Israeli women in the same region, and considerably lower than that of Arab Bedouin women in southern Israel. Increased understanding of the factors impacting the lives of Arab women may

serve to inform future studies, and are important for developing appropriate prevention and intervention programs [53–55] particularly in multi-cultural societies. For example among the factors which have been found salient in studies of postnatal depression in other non-Western societies is that of the newborn's gender, with a preference for male offspring and/or relations with the in-laws [21, 45, 55–61]. Prospective research following women from pregnancy through the postnatal period could provide insight into preventive measures that could be taken by early identification of at-risk women of distinct cultural background. In addition, minority group membership—as the Arabs are in Israel—should be considered a potential factor impacting emotional adjustment of population groups in public health planning in general, and maternal health in particular. It is hoped that future research will address these issues.

Since 1995, Israel has mandated universal health insurance for both preventive and acute care. This includes antenatal and postnatal follow-up, which is provided either by Ministry of Health MCHC centers or by one of the four Health Maintenance Organization clinics throughout the country. Regardless of the entity that offers the care, it is the Ministry that determines guidelines. In this context, it is the responsibility of the government to meet the needs of all citizens as well as possible. Given the differences in life styles and circumstances, health policy authorities should be informed regarding the needs of the various sub-populations.

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