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Prevalence and Associated Factors to Depression and Anxiety in Women with Premature Babies Hospitalized in a Neonatal Intensive-Care Unit in a Mexican Population

Adrián González-Hernández [a], Diana González-Hernandez [a], Carlos Mario Fortuny-Falconi [b], Carlos Alfonso Tovilla-Zárate [b,*], Ana Fresan [c], German Alberto Nolasco-Rosales [d], Isela Esther Juárez-Rojop [d], María Lilia López-Narváez [e], Thelma Beatriz Gonzalez-Castro [f], Yudy Merady Escobar Chan [b]

[a] Hospital General de Durango, Departamento de Salud Mental, Durango, Durango, Mexico
[b] Universidad Juárez Autónoma de Tabasco, División Académica Multidisciplinaria de Comalcalco, Comalcalco, Tabasco, Mexico
[c] Subdirección de Investigaciones Clínicas, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñíz, Ciudad de México, Mexico
[d] Universidad Juárez Autónoma de Tabasco, División Académica de Ciencias de la Salud, Villahermosa, Tabasco, Mexico
[e] Hospital General de Yajalón, Secretaría de Salud, Yajalón, Chiapas, Mexico
[f] Universidad Juárez Autónoma de Tabasco, División Académica Multidisciplinaria de Jalpa de Méndez, Jalpa de Méndez, Tabasco, Mexico

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ABSTRACT

Purpose: The aims of this study were to investigate the frequency of depression and anxiety in mothers of children hospitalized in a neonatal intensive care unit, and to determine the characteristics associated with depression and anxiety in a sample of Mexican mothers.
Method: We studied 188 mothers who had premature babies in a neonatal intensive-care. Sociodemographic and clinical characteristics were collected through a face to face interview performed by professional staff. We assessed depression using the Beck Depression Inventory (BDI) and clinical anxiety using the Hamilton Anxiety Rating Scale (HAM-A).
Results: Clinical anxiety was reported in more than one-third of women (34.0%, n = 64) followed by depression (19.7%, n = 37), while twenty-six women reported both significant depression and anxiety (13.8%). Women with both clinical symptoms were younger, they were more frequently students and were living within extended families. Women who presented only symptoms of depression reported lower educational level (elementary school 29.7%, n = 11).
Conclusion: Our results show a high incidence of anxiety, depression, and both emotional disorders in Mexican mothers of premature babies hospitalized in a neonatal intensive care unit. Demographic features such as occupation or age may impact the occurrence and severity of joint symptoms of depression and anxiety which should be monitored by the health team and referred to a mental health service.

Introduction

It is well-known that having a premature child is an overwhelming event for the parents; they face symptoms of depression, anxiety, fear, hostility and negative changes of sleeping patterns (Doering, Moser, & Dracup, 2000). Due to the severity of the event, the transfer to the neonatal intensive care unit (NICU) is usually rapid, in a hurry, and brings with it an abrupt change of roles and routines that affect both parents and family (Chien, Chiu, Lam, & Ip, 2006). Parents who experience these situations often have to deal with an unknown and unexplored environment such as the intensive care unit (Escudero, Viña, & Calleja, 2014).

On the other hand, peripartum depression is defined as an episode of major depression, with an onset during pregnancy or during the first 4 weeks of postpartum (Edition, 2013). It has been reported that 20% to 60% of mothers of premature babies show depression (Socarrás & Gamboa-Delgado, 2017) and up to 40–55% show anxiety (Greene, Rossman, Meier, & Patra, 2018). Feeling distant or less empowered to raise their babies (Bogen, Fisher, & Wisner, 2016) cause high levels of uncertainty in these mothers, which could lead to stress and depression. Furthermore, characteristics such as socioeconomic level, schooling, use of drugs, alcohol consumption and age of the mother, are considered

* Corresponding author at: Universidad Juárez Autónoma de Tabasco, División Académica Multidisciplinaria de Comalcalco, Ranchería Sur, Cuarta Sección, C. P. 86650 Comalcalco, Tabasco, Mexico.
E-mail addresses: alfonso_tovillaz@hotmail.com (C.A. Tovilla-Zárate), fresan@imp.edu.mx (A. Fresan).

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variables associated with depression and anxiety in these women (Aghajafari, Letourneau, Mahinpey, Cosic, & Giesbrecht, 2018; Beck, 2001; O'hara & Swain, 1996).

Knowing the degrees of depression and anxiety in mothers with premature babies hospitalized in neonatal intensive-care unit (NICU) is very important (Allan & Gilbert, 1997; Lara, 1991) as it has been observed that a high degree of depression is associated with neurodevelopmental delay of the baby (Betts, Williams, Najman, & Alati, 2015; Lebel et al., 2016; Matijasevich et al., 2015). Therefore, we decided to determine the frequency of depression and anxiety in mothers with children hospitalized in a neonatal intensive-care unit in a population of Durango, Mexico. This study also provides sociodemographic characteristics of the participants and the variables associated with depression and anxiety.

Methods

Subjects

A total of 188 mothers who had premature babies participated in the present study; their children were hospitalized in the neonatal intensive-care unit of the General Hospital of Durango, Mexico. This study was conducted from May 2016 to November 2017, mothers were evaluated two weeks at the earliest after having their babies. The interview with the mother lasted approximately one hour and the interview time was similar for all women.

The inclusion criteria were: mothers with premature babies in NICU level I, and that were admitted in NICU for 1 month or more respectively and agreed to participate by signing an informed consent. Mothers had to be at least 15 years old. The exclusion criteria were: mothers with a history of previous psychiatric diseases, severe medical illness or with babies in NICU levels II, III or IV.

Procedure

Mothers of premature babies were approached by a group of experts in mental health (including psychiatrists and psychologists); they were invited to participate in the study and were given a verbal explanation of the aims and procedures of the study. Patients did not receive any financial compensation to participate. This study fulfilled the ethical principles required by the hospital previously mentioned and by the declaration of Helsinki.

Measurements

The personal history of each patient was obtained through interviews conducted by professional staff in private. Sociodemographic data such as age, area of residence (referring to rural or urban area), years of schooling, type of family - nuclear or extended (according with the National Institute of Statics and Geography INEGI), marital status and type of home (referring to owned or rented).

The Beck Depression Inventory (BDI) was used to assess depression. The BDI is a questionnaire that consists of 21 items related to depressive symptoms with 4 options to choose. The total score range from 0 to 63, where 63 represent the maximum severity. A score of 10 to 16 indicates mild depression; from 17 to 29 reflect moderate depression severity, and from 30 points onward indicate severe depression. The BDI is reliable in Mexican population and has adequate internal consistency with a Cronbach's alpha coefficient of 0.87 (Jurado et al., 1998). For the evaluation of clinical anxiety, we used the Hamilton Anxiety Rating Scale (HAM-A). The HAM-A is a questionnaire that consists of 14 items designed to measure the severity of anxiety; it contains a variety of symptoms ranging from 0 to 4, where 4 is the highest expression of each symptom. A score of 17 exemplifies mild severity of anxiety, 18 to 24 indicate moderate severity and 25 to 30 indicate severe anxiety. This scale was validated for Mexican populations in 2002, with an alpha Cronbach coefficient of 0.89 as well as an inter-rater reliability >0.90 (Lobo et al., 2002).

For the present study we used a cut-off point of 17 in the BDI and a cut-off point of 18 in the HAM-A to identify mothers with moderate to severe depression and anxiety, respectively.

Statistical analysis

Frequencies and percentages were used for the description of categorical variables, while for continuous variables we used means and standard deviations (S.D.). Mothers were divided into four groups: 1) women without depression or anxiety, 2) women with depression, 3) women with anxiety and, 4) women with depression and anxiety. In order to compare variables among the four groups we used chi square tests ($\chi 2$). If any significant difference between were found, post-hoc tests were performed with the Holm correction was applied to address multiple comparisons. The alpha value for these tests was established at $p \leq 0.05$. All statistical procedures were performed using the SPSS statistical software version 22.0.

Results

Sample description

A total of 188 women with a mean age of 24.7 years (S.D. = 6.4, range 15–42) were recruited. Most women were married (84.0%, n = 158) and were housewives (85.1%, n = 160) at the time of the study. <15.0% were involved with other activities such as remunerated employment (8.5%, n = 16) or were students (6.4%, n = 12). The majority of women had attended secondary school (58.0%, n = 109), followed by woman who had studied high-school (25.5%, n = 48), then women who completed elementary school (11.7%, n = 22) or had a bachelor's degree (4.8%, n = 9).

Family characteristics

At the time of the study, 54.3% (n = 102) of woman were living in urban areas, while 45.7% (n = 86) were living in rural areas. The majority of women were living in a nuclear family (husband/partner and children; 62.2%, n = 117), while 37.8% (n = 71) were living within extended families (grandparents, siblings, uncles, cousins, etc.). Most women reported that their main economic support came from their husbands/partners (62.2%, n = 117) while the remaining 37.8% (n = 71) reported that their main support came from other sources including relatives.

Depression and anxiety

Almost one third of women did not show significant symptoms of depression or anxiety (32.4%, n = 61). Clinical anxiety was more frequently reported (34%, n = 64) than depression (19.7%, n = 37), a minority of women (13.8%, n = 26) reported both significant depression and anxiety.

Significant differences arose among groups regarding four variables: age, occupation, education, and type of family, while no differences were observed for the remaining variables as can be seen in Table 1. The post-hoc analyses showed that women without symptoms, women with depression and women with anxiety were similar in terms of age, occupation and type of family ($p > 0.05$). The most important differences were observed in the group of women with depression and anxiety: they were younger, more frequently students and lived within extended families, when compared to women without symptoms (age $p = 0.02$, occupation $p = 0.03$ and type of family $p = 0.01$), women with only depressive symptoms (age $p = 0.004$, occupation $p = 0.02$ and type of family $p = 0.02$) and women with only anxiety symptoms (age $p = 0.03$, occupation $p = 0.001$ and type of family $p = 0.01$). In

Table 1
Demographic and family environment variables among groups.

	Total Sample n = 188		Without symptoms n = 61		Depression n = 37		Anxiety n = 64		Depression and anxiety n = 26		Statistics
	n	%									
Education											
Elementary school	22	11.7	4	6.6	11	29.7	5	7.8	2	7.7	$\chi2 = 21.0$, $p = 0.01$
Secondary school	109	58.0	38	62.3	21	56.8	38	59.4	12	46.2	
High school	48	25.5	17	27.9	4	10.8	18	28.1	9	34.6	
Bachelor's degree	9	4.8	2	3.3	1	2.7	3	4.7	3	11.5	
Marital status											
Married	158	84.0	51	83.6	32	86.5	53	82.8	22	84.6	$\chi2 = 0.2$, $p = 0.96$
Single	30	16.0	10	16.4	5	13.5	11	17.2	4	15.4	
Occupation											
Student	12	6.4	4	6.6	1	2.7	1	1.6	6	23.1	$\chi2 = 18.8$, $p = 0.004$
Housewife	160	85.1	51	83.6	34	91.9	55	85.9	20	76.9	
Remunerated employment	16	8.5	6	9.8	2	5.4	8	12.5	0		
Family											
Nuclear	117	62.2	43	70.5	26	70.3	45	70.3	11	42.3	$\chi2 = 7.9$, $p = 0.04$
Extended	71	37.8	18	29.5	11	29.7	19	29.7	15	57.7	
Economic support											
Husband	117	62.2	38	62.3	26	70.3	39	60.9	14	53.8	$\chi2 = 1.8$, $p = 0.60$
Others	71	37.8	23	37.7	11	29.7	25	39.1	12	46.2	
Origin											
Urban	102	54.3	36	59.0	13	35.1	38	59.4	15	57.7	$\chi2 = 0.8$, $p = 0.36$
Rural	86	45.7	25	41.0	24	64.9	26	40.6	11	42.3	
Age by groups[a]											
<24 years	100	53.2	31	50.8	15	40.5	34	53.1	20	76.9	$\chi2 = 8.3$, $p = 0.03$
>24 years	88	46.8	30	49.2	22	59.5	30	46.9	6	23.1	

[a] The mean value of the total sample was used to dichotomize the variable and determine the OR.

terms of education, a higher proportion of women with only depressive symptoms reported lower educational level (elementary school) when compared to non-symptomatic women ($p = 0.01$), women with only anxiety symptoms ($p = 0.01$) and women with both anxiety and depression ($p = 0.01$), the last two groups mentioned were similar to each other ($p > 0.05$).

Discussion

The objectives of this study were to evaluate the prevalence of depression and anxiety symptoms in mothers of premature babies hospitalized in NICU; also, to know the sociodemographic variables that could be associated with these psychiatric conditions. To our knowledge, this is the first study in Mexican population that evaluates factors associated to postnatal depression and anxiety in mothers of premature babies in NICU.

We observed that mothers who were students were more likely to show depression and anxiety. It is known that parenthood affects educational expectations in Mexican-origin adolescent mothers. Furthermore, adolescent mothers with lower academic engagement often have themselves mothers who do not expect much from their daughters in terms of academic achievement; additionally, adolescent mothers may have lower academic expectations themselves (<high-school degree) (Bravo, Toomey, Umaña-Taylor, Updegraff, & Jahromi, 2017). In our sample we observed similar characteristics, since younger mothers presented significant mood disorders. It is possible to conceive that being a mother and a student at the same time, lead to greater stress than being a paid employee, as being a student is also tied to family expectations and even economic support. These young mothers could show a reduced ability to take care of their babies or show a significant drop in their self-esteem due to the uncertainty of having a baby to look after (Hoffman, Dunn, & Njoroge, 2017; Sansavini et al., 2015).

We also observed that mothers living in extended families had higher probability of been depressed and anxious. We consider that in addition to the pressure of having a baby in NICU, the possibility of stopping to no longer receiving economic support by their families added stress to these mothers (Falah-Hassani, Shiri, & Dennis, 2016; Imai et al., 2017; Leach, Poyser, & Fairweather-Schmidt, 2017). This could be important particularly in women of low socioeconomic status, previously reported in the literature as a risk factor for postpartum depression (Bener, Gerber, & Sheikh, 2012; Leung, Letourneau, Giesbrecht, Ntanda, & Hart, 2017; Özcan, Boyacıoğlu, & Dinç, 2017) and anxiety (Leach et al., 2017). Nevertheless, we cannot rule out that those mothers may already had a subsydromatic expression of depression or anxiety symptoms that increased their severity when their premature babies were placed in NICU.

Our results showed that mothers under 24 years of age were more likely to be depressed and anxious. This finding is similar to results of previous studies that reported young mothers have a higher risk for depression (Silverman et al., 2017). Similarly, it has been reported that postpartum anxiety is 33% more frequent in young mothers (Bener et al., 2012). Besides young age, postpartum depression has other risk factors such as premature delivery, little birth weight, initiation of breastfeeding, little infant weight and mode of feeding (Hoffman et al., 2017; Liu et al., 2017; Sansavini et al., 2015). Regarding social factors, adolescent mothers have high rates of residential mobility, need for financial support from their parents or public aid, and often have low or no support from the baby's father (Kumar, Raker, Ware, & Phipps, 2017). Furthermore, women living in extended families may face financial problems and lack of support from family and/or partner, which are situations also associated with postpartum depression and anxiety. Hence, alternative processes such as the creation of more hospital support groups and promotion of mental health services in intensive care units to help these women should be developed, particularly to prevent depression and anxiety in young mothers (Ganchimeg et al., 2014;

Hawes, McGowan, O'donnell, Tucker, & Vohr, 2016; Olshtain-Mann & Auslander, 2008).

Likewise, educational level seems to be a factor associated with depression and anxiety, in our study, mothers with lower educational levels showed more symptoms of depression which is similar to what has been reported in the scientific literature where younger mothers and those with lower educational levels are at higher risk for depression and anxiety (Alkozei, McMahon, & Lahav, 2014; Busse, Stromgren, Thorngate, & Thomas, 2013; Segre, McCabe, Chuffo-Siewert, & O'hara, 2014; Socarrás & Gamboa-Delgado, 2017).

Some limitations can be observed in our study; first we did not evaluate the fathers of the babies. Second, we did not have a comparison group that included mothers of full-term babies. Third, characteristics of the babies were not evaluated, nor the mother-infant relationship. Finally, the medical history of the mother was not taken into consideration; variables such as gravity or parity were not evaluated. However, the results of the present study could help to describe the mental status of mothers whose premature babies are in NICU in Mexican and maybe even Latin American populations.

In conclusion, our study showed a high prevalence of depression and anxiety in Mexican mothers of premature babies hospitalized in neonatal intensive-care unit. Risk factors for depression and anxiety in these women were being students, living within extended families and being under 24 years of age. Therefore, the role played by doctors, nurses and the entire medical team should not only address the premature babies' treatment in NICU but to consider the emotional state of the mothers and referred them to specialized mental health services if necessary.

CRediT authorship contribution statement

Adrián González-Hernández: Project administration, Conceptualization. **Diana González-Hernandez:** Methodology, Conceptualization. **Carlos Mario Fortuny-Falconi:** Methodology. **Carlos Alfonso Tovilla-Zárate:** Conceptualization, Writing-review & editing. **Ana Fresan:** Formal analysis. **German Alberto Nolasco-Rosales:** Conceptualization. **Isela Esther Juárez-Rojop:** Conceptualization. **María Lilia López-Narváez:** Writing-original draft. **Thelma Beatriz Gonzalez-Castro:** Writing - review & editing. **Yudy Merady Escobar Chan:** Conceptualization.

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Disclosure of conflict of interest

The authors declare no conflict of interest.

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