ORIGINAL ARTICLE

Predictors of post-partum stress in Vietnamese immigrant women in Taiwan

Li-Chun LEE[1,2] and Chich-Hsiu HUNG[1]

[1]School of Nursing, Kaohsiung Medical University and [2]Department of Nursing, I-Shou University, Kaohsiung, Taiwan

Abstract

Aim: The post-partum period is a stressful time of change, particularly for immigrant women, but, to the best of the present authors' knowledge, the subject has not been explored. This study aimed to examine immigrant women's post-partum stress, depression, and levels of social support, and to determine the predictors of post-partum stress for Vietnamese immigrant women in Taiwan.

Methods: A cross-sectional design was used. In this descriptive survey, 208 Vietnamese immigrant women were telephone interviewed by a trained Vietnamese research assistant during one of their 6 weeks post-partum. Data were collected through telephone interviews using three questionnaires, including the Hung Postpartum Stress Scale, Beck Depression Inventory, and Social Support Scale.

Results: The result shows that Vietnamese women had low level post-partum stress scores. Participants' family support rated higher than friend support. The incidence of depression was 0.5%. Social support, number of post-partum days, and family income were found to be predictors for post-partum stress, accounting for 26.6% of the variance. The Vietnamese immigrant women experienced significant stress regarding their maternal roles and received most of their support from their families rather than from friends.

Conclusion: Nurses caring for this cohort should therefore consider these factors in order to help them cope with their post-partum stress. Healthcare providers should offer available resources to these immigrant women and their spouses during this critical period in their lives. For instance, antenatal education classes could be provided to help immigrant women manage and overcome post-partum issues.

Key words: depression, immigrant women, post-partum stress, social support.

INTRODUCTION

Transcultural marriages in Taiwan have been increasing over the years. Before May 2012, there were more than 465,053 immigrant women married to Taiwanese men in Taiwan, 86,344 of whom were from Vietnam (National Immigration Agency, 2013). Because of transnational marriage, these women usually immigrate alone, leaving their country without family members and friends. They often become pregnant shortly after marriage (Lin & Hung, 2007). Therefore, they were confronted not only by culture shock, such as language barriers, eating habits, and social interaction (Chang & Myers, 2003), but also by pregnancy and delivery. These women often experience post-partum-related stress, and as such, require significant perinatal healthcare support (Hung, Wang, Chang, Jian, & Yang, 2012; Lin & Hung, 2007).

The post-partum period is a transitional and potentially stressful time for women as they face significant physiological changes and are tasked with their new maternal roles (Hung, 2005). This period is characterized by dramatic physiological changes, physical discomfort, as well as post-partum stress (Hung, 2004). Post-partum women experience fatigue, sleep-related problems, physical pain, sex-related issues, constipation,

Correspondence: Chich-Hsiu Hung, School of Nursing, Kaohsiung Medical University, no. 100, Shih-Chuan 1st Rd., Kaohsiung 80708, Taiwan. Email: chhung@kmu.edu.tw

and painful breast engorgement (Cheng & Li, 2008; McGovern *et al.*, 2007). Leung, Arthur, and Martinson (2005) found that post-partum women often suffer from frustration and feelings of failure and incompetence regarding their new roles as both wives and mothers, and are concerned about meeting other people's expectations. Altogether, their concerns about their maternal roles, body changes, and lack of social support contribute toward post-partum stress (Hung, 2004; Hung & Chung, 2001).

Previous studies have shown that social support is very important for women in their post-partum period, but that this support is often lacking. An early study by Nahas, Hillege, and Amasheh (1999) found that Middle Eastern immigrant women in Australia experienced loneliness and feelings of isolation because of lack of social support. Kim, Choi, and Ryu (2010) uncovered a correlation between lack of social support and high prenatal stress among immigrant women in Korea. Moreover, Hung (2004) found that social support is beneficial in promoting women's post-partum health and well-being. Hung and Chung (2001) discovered that significant social support, especially that coming from their families, leads to lower stress in post-partum women. Later studies (Abbott & Williams, 2006; Eastwood, Jalaludin, Kemp, Phung, & Barnett, 2012; Huang, Wong, Ronzio, & Yu, 2007) found similar results, showing that low levels of social support were associated with a high prevalence of depression in post-partum women.

Depression is a common affliction among post-partum women, with an average prevalence of 16.4–42.6% in immigrant women (Abbott & Williams, 2006; Eastwood *et al.*, 2012; Goyal, Murphy, & Cohen, 2006). Many studies have shown that social support is an important predictor of maternal depression (Huang *et al.*, 2007; Mechakra-Tahiri, Zunzunegui, & Seguin, 2007), and that higher levels of support and resources help alleviate this depression (Stewart, Gagnon, Saucier, Wahoush, & Dougherty, 2008). For instance, Chinese and South Asian post-partum immigrant women in Canada had maternal depression or emotional conflict if they did not receive emotional support from their husband or other important family members (Morrow, Smith, Lai, & Jaswal, 2008).

Because family expenses are increased after childbirth, Hung (2004) found that women with a high household income had a significantly lower level of post-partum depression compared with women who had a low household income. A longitudinal study was conducted with data collected at the 1st, 3rd, and 5th weeks of the post-partum period and indicated that "increased family expenses" was the top fourth, eighth, and sixth post-partum stressor respectively at the 1st, 3rd, and 5th weeks of the post-partum period (Hung & Chung, 2001). In addition, the primiparous women and multiparous women experienced unique post-partum stressors. Hung (2007a) found that primiparas had more post-partum stress than multiparas. Compared with primiparas, the mean scores of multiparas were lower for concerns about negative body changes and concerns about maternal role attainment. However, primiparous women had lower scores than multiparas regarding concerns about lack of social support (Hung, 2007b). Moreover, women's scores for post-partum stress at the 3rd week and 5th week were higher than the scores at the 1st week post-partum (Hung & Chung, 2001).

While many studies have previously examined immigrants' physical and mental well-being as well as the social support available to them, few have assessed post-partum stress in immigrants specifically. The purpose of the study was to determine the predictors of post-partum stress in Vietnamese immigrant women married to Taiwanese men living in Taiwan. This study aimed to examine immigrant women's post-partum stress, depression, and levels of social support, and to determine the predictors of post-partum stress for Vietnamese immigrant women in Taiwan.

METHODS

Design

This study was a descriptive survey and was part of a larger project examining the health status of post-partum immigrant women in Taiwan who came from other Asian countries, including Vietnam, China, Indonesia, Thailand, the Philippines, and Cambodia. This particular study focuses on the post-partum stress of only the Vietnamese immigrant cohort. More attention should be paid to this immigrant cohort because they are the major immigrant women in Taiwan.

Participants

Practical support and instruction in the care of newborn infants are required during the post-partum period. Stuchbery, Matthey, and Barnett (1998) indicated that Vietnamese immigrant women are a particularly vulnerable group because of the absence of their consanguineous families, particularly their mothers. In Taiwan, Vietnamese women are the majority of the population from Southeast Asia. These immigrants, with the

language barrier and social cultural differences, experienced more stress at marriage and foreign social life. In this study, the sample consisted of 208 post-partum Vietnamese women who were recruited from 11 general hospitals or obstetric clinics in the Kaohsiung metropolitan area. To be included in the study, participants had to be married to Taiwanese men, have recently delivered a full-term baby without complication, have no major post-partum health complications or underlying disease, have emigrated from Vietnam, able to communicate in Mandarin Chinese, and living in the Kaohsiung area in southern Taiwan during their post-partum period.

Instruments

Data were collected through telephone interviews using three questionnaires, including the Hung Postpartum Stress Scale (Hung PSS), Beck Depression Inventory (BDI), and Social Support Scale (SSS). The Hung PSS consists of questions pertaining to concerns about maternal role attainment (27 items), lack of social support (20 items), and negative body changes (14 items). In this questionnaire, women rated how often they felt stress over each item on a 5 point Likert-type scale, where 1 means "not at all" and 5 means "always". Possible total scores ranged 61–305, with the higher the score, the higher the perceived post-partum stress. The internal consistency coefficient using Cronbach's alpha has been reported to be 0.94–0.95 (Hung, 2005; Hung & Chung, 2001). The Cronbach's alpha for this study was 0.90.

The second edition of the BDI (BDI-II; Beck, Steer, & Brown, 1996) is one of the most widely used scales for assessing depression. It consists of 21 items, each rated on a 4 point scale. Participants were asked to consider each item as they relate to their experiences in the past 2 weeks. The cut-off point for classifying a participant as depressed was 13. The scale has good internal consistency reliability and test–retest reliability (Beck *et al.*, 1996). Discriminant validity for this scale has also been confirmed in other studies (Krefetz, Steer, Gulab, & Beck, 2002; Storch, Roberti, & Roth, 2004). The scale has a high internal consistency indicated by a Cronbach's alpha of 0.88 (Hung, 2004). The Cronbach's alpha for this study was 0.74.

The SSS (Smilkstein, Ashworth, & Montano, 1982) consists of five items for family support and five items for friend support, rated on a 5 point Likert-type scale, where 1 stands for "never" and 5 "always". Ratings are added to obtain each participant's total score, ranging 10–50. This total score represents the frequency with which participants receive social support from family

(Smilkstein, 1978) and friends (Smilkstein *et al.*, 1982). High scores indicate high social support during the post-partum period. The scale's correlations with the Pless–Satterwhite Family Function Index and Psychotherapist Estimate were 0.80 and 0.64, respectively (Smilkstein *et al.*, 1982); and its Cronbach's α was 0.86 (Smilkstein *et al.*, 1982). The SSS has been used extensively in other studies and its construct validity has been verified through factor analysis (Hung & Chung, 2001; Hung, Tseng, & Cheng, 1995). Its reliability as represented by the Cronbach's alpha was found to be 0.90–0.92 (Hung, 2004; Hung & Chung, 2001). The Cronbach's alpha for this study was 0.90.

Data collection

Potential participants were visited during their post-partum hospitalization by a trained Vietnamese research assistant who was fluent in Mandarin Chinese, collected their demographic data, and set up an appointment to administer the three scales. The participants were given a written description of the study's purpose and procedures, in addition to a consent form. Once a signed informed consent was obtained, the research assistant scheduled the participants for interview during one of their 6 weeks post-partum using systematic sampling. The Hung PSS, BDI-II, and SSS were administered by telephone interviews to the participants 1–6 weeks after their discharge from the hospital.

Ethical considerations

The institutional review board from affiliated university approved the project. A signed informed consent was obtained when participants agreed to participate in this study. Details about the study's purpose, process, and expected contribution to the welfare of post-partum Vietnamese women were explained to the participants before data collection. Participants were given the option to refuse to participate at any stage of the study. Any information obtained in connection with this study that could be referred back to the participant was kept anonymous and confidential. Only aggregated data would be shared with professional colleagues. The collected data were locked in the researcher's office and only the researcher had access to the data.

Data analysis

Data were analyzed using the SPSS version 13.0 software for Windows (SPSS, Chicago, IL, USA). The analysis included the χ^2-test, Student's *t*-test, one-way ANOVA, Pearson's correlation, and stepwise regression. Variables with a significant relationship with post-partum stress

($P < 0.05$) were further evaluated through multiple regression. Possible predictors were evaluated in main effects models using a stepwise effect selection technique using a P-value of greater than 0.10 for deletion and less than 0.05 for entry. The dependent variable in the analysis was post-partum stress. Multiple regressions were used to evaluate the estimate (β) and 95% confidence interval.

RESULTS

Demographic characteristics

On average, participants were 24.2 ± 3.8 years of age. Most had junior high school education or below (68.8%) and were housewives (79.3%). A high portion reported a total household income of less than $US 900/month (38.5%). Most of these women were primiparas (61.5%). Most had had vaginal births (65.4%) while the rest had undergone cesarean section (34.6%). Slightly over half (51.4%) had given birth to boys. Most breastfed their newborns (64.9%). The mean number of post-partum days for the participants was 21.1 ± 12.3 (Table 1).

Post-partum stress, social support, and depression

The mean post-partum stress scores were 78.7 ± 13.6, with scores ranging 61–154. The mean subscale scores were 36.8 ± 8.0 for concerns about maternal role attainment, 23.5 ± 4.7 for lack of social support, and 18.3 ± 3.7 for negative body changes. The social support score averaged 26.2 (standard deviation = 9.0), with more support coming from family than from friends. All participants' depression scores were within a normal range except one post-partum woman who was classified as depressed (Table 2).

Relationships between post-partum stress and demographic characteristics, social support, and depression

The present authors analyzed the data to determine which factors are associated with immigrant women's post-partum stress. The results showed that women's post-partum stress was negatively correlated with family income ($F = 3.94$, $P < 0.02$), being primipara ($t = 4.42$, $P < 0.04$), days post-partum ($r = -0.14$, $P < 0.04$), and social support levels ($r = -0.47$, $P < 0.00$). Scheffé's post-hoc test revealed that the participants' post-partum stress was highest when living in households with incomes of less than $US 900 and lowest in those

Table 1 Characteristics of participants ($n = 208$)

Variables	N	%	Mean	SD
Age			24.2	3.8
Education				
Junior high school or below	143	68.8		
Senior high school or above	65	31.2		
Job status				
No	165	79.3		
Yes	43	20.7		
Family income per month				
<$US 900	80	38.5		
$US 900–1200	65	31.2		
>$US 1200	63	30.3		
Para				
Primiparous	128	61.5		
Multiparous	80	38.5		
Type of delivery				
Vaginal	136	65.4		
Cesarean	72	34.6		
Sex of the newborn				
Male	107	51.4		
Female	101	48.6		
Feeding mode				
Breast	135	64.9		
Formula	21	10.1		
Mixed	52	25.0		
Days post-partum			21.1	12.3

SD, standard deviation.

Table 2 Women's post-partum stress, social support, and depression ($n = 208$)

Variables	N	%	Mean	SD
Post-partum stress			78.7	13.6
Maternal role attainment			36.8	8.0
Lack of social support			23.5	4.7
Negative body changes			18.3	3.7
Social support			26.2	9.0
Family's support			17.1	6.5
Friends' support			9.1	4.6
Depression				
Normal (0–13 score)	207	99.5		
Depressed (≥14 score)	1	0.5		

SD, standard deviation.

making more than $US 1200. More post-partum stress was found in primiparas than multiparas. The results also indicated that women in their early post-partum days and those who had lower social support exhibited significantly higher levels of post-partum stress (Table 3).

Predictors of post-partum stress

For predicting factors of post-partum stress, multiple regression analysis was conducted with post-partum stress as a dependent variable and family income, para, days of post-partum, and social support as independent variables. Multiple regression analysis revealed that lower levels of social support, fewer days post-partum, and lower family incomes (<$US 900) predicted greater post-partum stress in the participants. These predictors accounted for 26.6% of the total variance (Table 4).

DISCUSSION

The results of this study with Vietnamese immigrant women in Taiwan found that primiparas experienced more post-partum stress than multiparas. Social support

Table 3 Relationships between Vietnamese immigrant women's post-partum stress and their characteristics, social support, and depression ($n = 208$)

Variables	N	Mean	SD	*F/t/r*	*P*
Age				−0.06	0.39
Education				2.65	0.11
Junior high school or below	143	79.8	14.5		
Senior high school or above	65	76.4	11.6		
Job status				0.86	0.36
No	165	78.2	13.1		
Yes	43	80.5	15.6		
Family income per month				3.94	0.02*
<$US 900	80	81.4	14.2		
$US 900–1200	65	77.8	12.6		
>$US 1200	63	75.3	11.4		
Para				4.42	0.04*
Primiparous	128	80.3	13.3		
Multiparous	80	76.2	13.9		
Type of delivery				0.70	0.40
Vaginal births	136	79.3	15.0		
Cesarean	72	77.6	10.6		
Sex of the new born				2.31	0.13
Male	107	77.3	11.4		
Female	101	80.2	15.5		
Feeding mode				0.37	0.69
Breast	135	79.3	14.6		
Formula	21	77.2	11.7		
Mixed	52	77.7	11.7		
Days post-partum				−0.14	0.04*
Social support				−0.47	0.00**
Depression				–	–
0–13 score	207	78.4	13.0		
≥14 score	1	136.0			

*$P < 0.05$, **$P < 0.01$. SD, standard deviation.

Table 4 Regression model for Vietnamese immigrant women's post-partum stress

Term	Eigenvalues	Estimate	SE	*t* ratio	95% CI	*P*	R^2
Intercept	2.573	77.6	1.0				26.6%
Social support	1.004	−0.7	0.1	−7.82	(−0.90 to −0.54)	0.00	
Days post-partum	0.306	−0.2	0.1	−2.88	(−0.33 to −0.05)	0.00	
Family income <$US 900	0.117	3.3	1.7	1.99	(−0.01 to 6.69)	0.04	

$Y = 77.6 - 0.7$ social support $- 0.2$ days post-partum $+ 3.3$ family income of <$USD 900. CI, confidence interval; SE, standard error.

for this cohort mainly came from their families rather than friends. Depression was found to be minimal. The results also indicated that lower levels of social support, fewer days post-partum, and lower family incomes (<$US 900) were important predictors for post-partum stress in this cohort.

The present authors' findings showed that Vietnamese immigrant women in Taiwan had low post-partum stress levels with a mean score of 78.7 ± 13.6, less than the findings reported by Hung, Lin, Stocker, and Yu (2011) and by Hung (2004) for Taiwanese women in general. However, Nahas *et al*. (1999) in their study of Middle Eastern immigrant post-partum women in Australia, found that immigrant women had high stress, because they felt helpless owing to their inability to cope with their overwhelming roles as mothers and wives, and concerns about failure and being labeled a "bad mother" by their in-laws.

The results also revealed that women giving birth for the first time experience higher post-partum stress than those who have given birth previously, primarily because they still need to adapt to their new motherhood role. Other factors that contribute to post-partum stress in primiparas include limited access to health information, and functional and cultural adjustments associated with immigration (Reitmanova & Gustafson, 2008).

Previous research has shown that social support is particularly important in helping post-partum women adapt to their new maternal roles (Hung *et al*., 2011; Mechakra-Tahiri *et al*., 2007; Nahas *et al*., 1999). This study found that the main source of social support for the present authors' participants was family. Compared with Taiwanese post-partum women (Hung *et al*., 2011), this study found that the Vietnamese immigrant post-partum women received lower social support from their family and friends than Taiwanese women.

Vietnamese immigrant women are a particularly vulnerable group as they receive less support from their spouses compared with their other immigrant counterparts (Martinez-Schallmoser, Telleen, & Macmullen, 2003; Sheng, Le, & Perry, 2010). In this study, the present authors found that social support is a significant predictor for post-partum stress in this cohort, confirming previous findings on both immigrant and non-immigrant women, which showed that immigrant women with higher social support had lower post-partum stress and better health (Abbott & Williams, 2006; Hung & Chung, 2001; Huang *et al*., 2007).

The present authors' results revealed a low incidence of maternal depression (0.5%) among the Vietnamese immigrant women, consistent with a previous study by

Lin and Hung (2007), who found that the incidence of maternal depression for this cohort is 1.4%. Studies of other immigrant groups, however, revealed higher incidences of maternal depression. For instance, maternal depression rates for Indian immigrant women in the USA and immigrant women in Canada were 24% and 15%, respectively (Goyal *et al*., 2006; Sword, Watt, & Krueger, 2006). This suggests that incidence rates for maternal depression vary from one immigrant group to another. Future studies may explore the underlying causes for this variance.

This study also found that the number of post-partum days is an important determinant of post-partum stress, consistent with findings of previous studies (Huang *et al*., 2007; Mechakra-Tahiri *et al*., 2007). The results revealed that the fewer the number of post-partum days, the higher the level of stress experienced by the immigrant women regarding their ability to fulfill their maternal roles. This suggests a need for nurses and other health professionals to teach maternal skills and coping strategies to new post-partum immigrant women.

Economic status was also identified as another important predictor for post-partum stress, consistent with previous studies (Hung, 2004; Petrou, Kupek, & Gray, 2007). Low socioeconomic status of these immigrant families face financial problems in housing due to the impact of job deskilling (Morrow *et al*., 2008). The present authors found that most of the participants fell into the middle-low family income level. The Ministry of the Interior, Department of Statistics (2009) in Taiwan considers low $US 720 per month or less as "low income." Because immigrant families usually fall in the middle-low income category (Lee, Yin, & Yu, 2009; Mumtaz, Beverley, & Higginbottom, 2014), they are in greater need of job assistance such as vocational training in order to supplement their family income.

Because this study was conducted in a homogeneous, low-risk sample of post-partum Vietnamese immigrant women, this suggests that a further study is needed, especially for immigrant post-partum women who are of low family income, lack social support, and in the early post-partum period. Future research could also be done on high-risk immigrant women. Compared with Hung *et al*.'s (2011) and Hung's (2004), studies, the results of this study revealed that Vietnamese immigrant women in Taiwan differed from their non-immigrant counterparts. Their mean score of post-partum stress was 78.7 ± 13.6 whereas the mean scores were 127.5 ± 34.6 for Taiwanese women in general, 125.92 ± 30.2 for Taiwanese native primiparas, and 121.26 ± 30.6 for Taiwanese native multiparas. These results were consistent

with findings from previous studies (Huang *et al.*, 2007; Mechakra-Tahiri *et al.*, 2007). Thus, further examination of the underlying causes of this variance is needed.

CONCLUSIONS

The results of this study revealed that lower levels of social support, fewer days post-partum, and lower family incomes are significant predictors of post-partum stress in Vietnamese immigrant women in Taiwan. Nurses caring for this cohort should therefore consider these factors in order to help them cope with their post-partum stress. Nurses should offer available resources to these immigrant women and their families during this critical period in their lives. For instance, antenatal education classes could be provided to help immigrant women manage and overcome post-partum issues. Generally, women are discharged from hospital 3–5 days after delivery in Taiwan. The present authors encourage immigrant women who have child-rearing experience to join a voluntary service. Those volunteers will perform home visits to the subgroup after 1 week post-partum, especially for those with low family income and with lack of social support, and being primipara. Therefore, they will help immigrant women and their families to adapt their lives in the post-partum period.

ACKNOWLEDGMENTS

CONFLICTS OF INTEREST

No conflict of interest is declared by the authors.

AUTHOR CONTRIBUTIONS

L.-C. L. performed the data analysis and was responsible for the drafting of the manuscript; C.-H. H. was responsible for the study conception, design, and data collection, and made critical revisions to the paper for important intellectual content.

REFERENCES

Abbott, M. W. & Williams, M. M. (2006). Postnatal depressive symptoms among Pacific mothers in Auckland: Prevalence and risk factors. *The Australian and New Zealand Journal of Psychiatry*, 40, 230–238.

Beck, A. T., Steer, R. & Brown, G. K. (1996). *Manual for the beck depression inventory – II*. San Antonio, TX: Psychological Corporation.

Chang, C. Y. & Myers, J. E. (2003). Cultural adaptation of the wellness evaluation of lifestyle: An assessment challenge. *Measurement and Evaluation in Counseling and Development*, 35, 239–251.

Cheng, C. Y. & Li, Q. (2008). Integrative review of research on general health status and prevalence of common physical health conditions of women after childbirth. *Women's Health Issues*, 18, 267–280.

Eastwood, J. G., Jalaludin, B. B., Kemp, L. A., Phung, H. N. & Barnett, B. E. (2012). Relationship of postnatal depressive symptoms to infant temperament, maternal expectations, social support and other potential risk factors: Findings from a large Australian cross-sectional study. *BMC Pregnancy and Childbirth*, 12, 148.

Goyal, D., Murphy, S. O. & Cohen, J. (2006). Immigrant Asian Indian women and postpartum depression. *Journal of Obstetric, Gynecologic, And Neonatal Nursing: JOGNN / NAACOG*, 35, 98–104.

Huang, Z. J., Wong, F. Y., Ronzio, C. R. & Yu, S. M. (2007). Depressive symptomatology and mental health help-seeking patterns of U.S. - and foreign-born mothers. *Maternal And Child Health Journal*, 11, 257–267.

Hung, C., Wang, H. H., Chang, S. H., Jian, S. Y. & Yang, Y. M. (2012). The health status of postpartum immigrant women in Taiwan. *Journal of Clinical Nursing*, 21, 1544–1553.

Hung, C. H. (2004). Predictors of postpartum women's health status. *Journal of Nursing Scholarship*, 36, 345–351.

Hung, C. H. (2005). Measuring postpartum stress. *Journal of Advanced Nursing*, 50, 417–424.

Hung, C. H. (2007a). Psychosocial features at different periods after childbirth. *Kaohsiung Journal of Medical Sciences*, 23, 71–79.

Hung, C. H. (2007b). The psychosocial consequences for primiparas and multiparas. *Kaohsiung Journal of Medical Sciences*, 23, 353–361.

Hung, C. H. & Chung, H. H. (2001). The effects of postpartum stress and social support on postpartum women's health status. *Journal of Advanced Nursing*, 36, 676–684.

Hung, C. H., Lin, C., Stocker, J. & Yu, C. Y. (2011). Predictors of postpartum stress. *Journal of Clinical Nursing*, 20, 666–674.

Hung, C. H., Tseng, Y. F. & Cheng, H. R. (1995). Effect of group teaching projects on women's stress during postpartum hospitalization. *The Kaohsiung Journal of Medical Science*, 11, 205–212.

Kim, Y., Choi, S. & Ryu, E. (2010). Social support, stress, and practice of prenatal care in married immigrant women in Korea. *Journal of Transcultural Nursing*, 21, 325–331.

Krefetz, D. G., Steer, R. A., Gulab, N. A. & Beck, A. T. (2002). Convergent validity of the Beck depression inventory-II with the Reynolds adolescent depression scale in psychiatric inpatients. *Journal of Personality Assessment*, *78*, 451–460.

Lee, L. C., Yin, T. J. & Yu, S. (2009). Prenatal examination utilization and its determinants for immigrant women in Taiwan: An exploratory study. *The Journal of Nursing Research*, *17*, 73–82.

Leung, S., Arthur, D. G. & Martinson, I. (2005). Stress in women with postpartum depression: A phenomenological study. *Journal of Advanced Nursing*, *51*, 353–360.

Lin, L. H. & Hung, C. H. (2007). Vietnamese women immigrants' life adaptation, social support, and depression. *The Journal of Nursing Research*, *15*, 243–254.

Martinez-Schallmoser, L., Telleen, S. & Macmullen, N. J. (2003). The effect of social support and acculturation on postpartum depression in Mexican American women. *Journal of Transcultural Nursing*, *14*, 329–338.

McGovern, P., Dowd, B., Gjerdingen, D., Dagher, R., Ukestad, L., McCaffrey, D. *et al.* (2007). Mothers' health and work-related factors at 11 weeks postpartum. *The Annals of Family Medicine*, *5*, 519–527.

Mechakra-Tahiri, S., Zunzunegui, M. V. & Seguin, L. (2007). Self-rated health and postnatal depressive symptoms among immigrant mothers in Qumbec. *Women & Health*, *45*, 1–17.

Ministry of the interior, Department of statistics. (2009). *Survey the living conditions of low-income households in 2008*. [Cited 30 Jul 2010.] Available from URL: http://www.moi.gov.tw/stat/survey.aspx

Morrow, M., Smith, J. E., Lai, Y. & Jaswal, S. (2008). Shifting landscapes: Immigrant women and postpartum depression. *Health Care For Women International*, *29*, 593–617.

Mumtaz, Z., Beverley, O. & Higginbottom, G. (2014). Navigating maternity health care: A survey of the Canadian prairie newcomer experience. *BMC Pregnancy and Childbirth*, *14*, 4.

Nahas, V. L., Hillege, S. & Amasheh, N. (1999). Postpartum depression. The lived experiences of Middle Eastern migrant women in Australia. *Journal of Nurse-Midwifery*, *44*, 65–74.

National Immigration Agency. (2013). *The number of marriage immigrant women and the number of immigrant women from mainland including Hong Kong and Macao*. (Updated May 30, 2013.) [Cited 20 Jul 2013.] Available from URL: http://statis.moi.gov.tw/micst/stmain.jsp?sys =100

Petrou, S., Kupek, E. & Gray, R. (2007). Income inequalities and self-reported maternal health status: Cross-sectional national survey. *BJOG: An International Journal of Obstetrics And Gynaecology*, *114*, 1018–1022.

Reitmanova, S. & Gustafson, D. L. (2008). "They can't understand it": Maternity health and care needs of immigrant Muslim women in St. John's, Newfoundland. *Maternal And Child Health Journal*, *12*, 101–111.

Sheng, X., Le, H. N. & Perry, D. (2010). Perceived satisfaction with social support and depressive symptoms in perinatal Latinas. *Journal of Transcultural Nursing*, *21*, 35–44.

Smilkstein, G. (1978). The family APGAR: A proposal for a family function test and its use by physicians. *The Journal of Family Practice*, *6*, 1231–1239.

Smilkstein, G., Ashworth, C. & Montano, D. (1982). Validity and reliability of the family APGAR as a test of family function. *The Journal of Family Practice*, *15*, 303–311.

Stewart, D. E., Gagnon, A., Saucier, J. F., Wahoush, O. & Dougherty, G. (2008). Postpartum depression symptoms in newcomers. *Canadian Journal of Psychiatry. Revue Canadienne De Psychiatrie*, *53*, 121–124.

Storch, E. A., Roberti, J. W. & Roth, D. A. (2004). Factor structure, concurrent validity, and internal consistency of the Beck Depression Inventory-Second Edition in a sample of college students. *Depression and Anxiety*, *19*, 187–189.

Stuchbery, M., Matthey, S. & Barnett, B. (1998). Postnatal depression and social supports in Vietnamese, Arabic and Anglo-Celtic mothers. *Social Psychiatry and Psychiatric Epidemiology*, *33*, 483–490.

Sword, W., Watt, S. & Krueger, P. (2006). Postpartum health, service needs, and access to care experiences of immigrant and Canadian-born women. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: JOGNN / NAACOG*, *35*, 717–727.