The Association Between Post-Migration Stressors in Refugee Mothers, and Infant

Development: Do Maternal Depressive Symptoms Play a Role?

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Abstract

The current study examined the association between the post-migration stressors refugee mothers experience and infant cognitive and social-emotional development. Maternal depressive symptoms were also examined as a mechanism that could potentially explain this association. This specific project was part of a larger study pertaining to refugee mothers and infant development. Participants were recruited by interpreters and included 40 refugee mothers and their infants, aged 4 months to 12 months. Mothers reported on the post-migration stressors they have experienced, their depressive symptoms, and their infant's social-emotional development. A standard cognitive assessment to evaluate infant cognitive development was also administered. Findings indicated that post-migration living difficulties and infant development were not associated directly or indirectly through maternal depressive symptoms; however, post-migration living difficulties and depressive symptoms were associated. This study is the first study to examine the relationship between maternal post-migration stressors in refugees and infant development. The findings suggest that post-migration stressors may be related to depressive symptoms in refugee mothers, which illustrates the importance of focusing on post-migration factors in clinical settings. Further research should be conducted to evaluate the relationship between post-migrations stressors and infant development.

Introduction

In 2014, the estimated refugee population in the world was 14.4 million (Refugees, 2014), with the United States resettling approximately 69,986 of those refugees. This number is expected to grow to 85,000 in 2016 (Refugee Arrival Data, Proposed). Vermont has been a relatively large resettlement center considering its small size, with more than 7,000 refugees having resettled in the state since 1980 (Kelley, 2014). Although Vermont's population accounts for less than .2% of the country's population, about .45% of the refugees arriving in the United States each year resettle in Vermont (Refugee Arrival Data). As the number of refugees resettling in our country and state is increasing, it is pertinent to understand the difficulties that refugees experience, as well as the impact that these stressors may have on individuals' mental health and that of their family members, in particular children.

The 1951 Refugee Convention defines a refugee as an individual who is living outside their country of origin or former country in which they lived in, and has a fear of being persecuted based on race, religion, nationality, and/or membership of a particular social group or political opinion (Geneva Convention, 1951). Many refugees are impacted by unique stressors prior to resettlement, during migration, and after resettlement (Dunlavy, 2010; Silove & Ekblad, 2002). While many studies have focused on pre-migration experiences, such as torture and trauma, fewer studies have looked at the impact of post-migration issues. The current study focuses on stressors occurring *after* refugees resettle in their new country (Dunlavy, 2010; Silove & Ekblad, 2002).

The most common stressors faced by refugees include problems with finances, health, family relations, discrimination, and immigration (Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997). Financial problems are particularly challenging as refugees are often only provided

with financial assistance for approximately eight months (Shani et al., 2009). This short period of assistance forces them to find jobs immediately, which often results in low-income opportunities (Shani et al., 2009). Moreover, health concerns can exacerbate stress since physicians may be difficult to access due to transportation issues and language barriers (Shani et al., 2009). Additionally, when refugees resettle in a new country, they are often forced to leave family members behind and, therefore, worry about the safety of these individuals (Silove et al., 1997). Further stressors arise as refugees originate from different cultures, backgrounds, and religions, which can lead to discrimination (Perera et al., 2013; Refugee Arrival Data). Lastly, issues with immigration, such as not receiving a green card in a timely manner, may contribute to further stress (Silove et al., 1997).

Not surprisingly as a result of the stressors just delineated, refugees experience higher levels of mental health problems than non-refugees in their host country, particularly depressive symptoms (Gerristen, Bramsen, Deville, van Willigen, Hovens, & vander Ploeg, 2006; Mölsä, Punamäki, Saarni, Tiilikainen, Kuittinen, & Honkasalo, 2014). Social and economic difficulties, loss of culture and support systems, leaving family members behind, struggles with employment, and issues with adjusting to a new culture have all been associated with psychological distress generally and/or depressive symptoms specifically (Carswell, Blackburn, & Barker, 2011; Gerristen et al., 2006; Mölsä et al., 2014; Silove, Seel, McGorry, & Mohan, 1998; Thapa, Dalgard, Claussen, Sandvik, & Hauff, 2007). Encouragingly, research suggests that decreasing these types of post-migration stress can result in a decrease in depressive symptoms as well (Syed et al., 2006).

Of particular interest for the current investigation, adult female refugees who have migrated to a new country have been found to be more vulnerable to depressive symptoms when

compared to adult males (Gerritsen et al., 2006; Thapa et al., 2007). Although many adult female refugees experience trauma, such as sexual assault, rape and other forms of psychological warfare prior to migration, post-migration stress can be as difficult for them as these pre-migration trauma events (Berman, Girón, Rosa, & Marroquín, 2006). Specifically, several investigators have found that quality of life may be driven more by post-migration events than traumas experienced prior to resettlement (Ekblad, Abazari, & Eriksson, 1999; Samarasinghe & Arvidsson, 2002). Of importance, building from Family Stress Theory and from a family systems perspective (McCubbin, 1993; Cox & Paley, 1997), stress may not only have an impact on mothers but on their children as well (Kingston, Tough, &Whitfield, 2012). Infant development, in particular, may be greatly affected by high levels of maternal stress and the occurrence of depressive symptoms in mothers.

The first three years of a human life is a critical period as 80% of brain development occurs during this time (Allen, 2011). Distress, both prenatal and postpartum, can adversely affect an infant's development (Kingston et al., 2012). In 1991, Cushman observed Kuwait refugee camps and found that, despite access to adequate food, infant formula, medicine, and clean water, infants in these camps had delayed mental/cognitive development. The authors speculated, but did not test, that the slow development of these infants is due, at least in part, to maternal despair and stress (Cushman, 1991). Aside from these observations, adequate attention has not been placed on either the role of stressors in the development of infants of refugees or how a mother's psychopathology in these parent-child dyads may contribute to the infant's development. However, drawing from the non- refugee literature, there is evidence that a mother's psychopathology can affect her infant's development. In a review of the literature, Kingston et al. (2012) found that postpartum distress contributes specifically to both cognitive

and socio-emotional development of infants. Conroy et al. (2012) found that maternal depression in particular was associated with impaired infant cognitive scores and increased levels of socio-emotional issues, specifically internalizing behavior, at 18 months of age.

The Current Study and Hypotheses

The purpose of the proposed study is to examine the association between post-migration stressors experienced by mothers who have resettled to the United States and the cognitive and socio-emotional development of their infants. Furthermore, the role of maternal depressive symptoms in the association of these stressors and infant development will be examined. Based on Family Stress Theory (McCubbin, 1993), it is expected that higher occurrences of post-migration stressors will be negatively related to cognitive and social-emotional infant development in the refugee population. It also is expected that the relationship between post-migration stressors and infant development will be partially explained by the presence of maternal depressive symptoms. Specifically, it is proposed that post-migration stressors will be positively associated with maternal depressive symptoms which, in turn, will be negatively associated with both areas of infant development.

Method

Participants

This project was part of a larger study examining variables associated with refugee mother-infant dyads and infant development. The sample consisted of refugee mothers (N=40) and their 4 to 12 month old infants (*M*=7.08, *SD*= 2.83). Mothers were informed about the study through local refugee organizations in the Burlington and Winooski area. To be eligible to participate, mothers had to have resettled to the U.S. as either a refugee or an asylum-seeker. Mothers were on average 29.9 years old (*SD*=5.9). Participants predominantly identified as

Bhutanese/Nepalese (74.4%), with the remaining participants identifying as Middle Eastern

(7.7%), Somali-Bantu (7.7%), or other (10.2%). Education level of participants varied with

43.6% of the mothers having attended high school, while others never attended school (7.7%),

attended elementary school (28.2%), attended some college (10.3%), or completed college

(10.3%). Mothers had an average between two and three children (*M*=2.58, *SD*=1.9).

Procedure

All procedures were approved by the Institutional Review Board (IRB) at the University

of Vermont. Participants and their infants came to either the University of Vermont's Behavior

Therapy and Psychotherapy Center (BTPC) or The Association of Africans Living in Vermont

(AALV). Each mother-infant dyad participated in one session. Sessions lasted approximately 1.5

– 2.5 hours, depending on the length of the participant's answers and the temperament of the

infant. Sessions were also scheduled so that they did not conflict with the infant's usual routine,

such as during naptime.

Each session was conducted by either one or two evaluators, as well as an interpreter. All

evaluators were trained on how to work with interpreters, administration of the Bayley Scales of

Infant Development (BSID), and administration of the specific questionnaires. At the beginning

of each session, the consent form was read to each participant by the evaluator with

interpretation. As required by the Institutional Review Board (IRB), the participants were

informed that they did not have to participate in the study and that they could refrain from

answering any questions that made them uncomfortable. They were also told that they could end

the study at any time if they did not wish to continue.

During the session each mother completed a multitude of self-report measures. The infant

cognitive assessment of the BSID was also administered. The questions on the self-report

measures were interpreted, since many of the participants were unable to read English. At the end of the session an image-based relaxation strategy was offered to the participants if they were experiencing distress due to the sensitive questions on some of the measures. The practice involved the participant closing her eyes and the evaluator leading her through an imaginal scene of a safe place of her choosing. The participants were given a toy and a book, which were both appropriate for the age of the infants in the study, as compensation for their participation. A 30-minute follow-up session was offered to participants and scheduled for a later date to provide the mother with feedback about her infant's strengths and weaknesses.

Measures

Demographic Questionnaire. This form was designed specifically for this study and used to gather demographic information regarding the mothers, such as age, ethnicity, religion, education, occupation, and income. The form also included questions about family members, such as marital satisfaction and age of children.

Post Migration Living Difficulties Checklist. The Post Migration Living Difficulties Checklist (Silove et al., 1998) is a self-report measure that was developed to evaluate post-migration stressors of refugees. The original checklist consisted of 23 common problems that refugees experience in the areas of finances, health, family and relations, discrimination, and immigration. Each problem is rated on a 5-point rating scale ranging from 0 (not a problem) to 5 (a very serious problem). Scores were summed for the 23 items. A modified version of this measure was used based on the feedback received through interviews with cultural consultants. Internal consistency for the checklist was excellent ($\alpha = .944$) in the current study.

Brief Symptom Inventory-18 (BSI). The Brief Symptom Inventory (Derogatis, 2000) provides self-reported data to measure psychological symptoms. The questionnaire contains 18

items with a 5-point rating scale ranging from 0 (not at all) to 5 (extremely). The checklist examines an overview of symptoms as well as the intensity of the symptoms within the last week. The depression subscale, consisting of six items, was utilized in this project. Sums were scored for the six items. The internal consistency for the subscale was excellent (α= .87) in the current study.

Bayley Scales of Infant Development, Third Edition. The social-emotional subtest of the Bayley Scales of Infant Development (Bayley, 2006) provides a score of the social-emotional ability of the infant. The parent is asked to respond to the questions using a likert scale ranging from 1 (not at all) to 5 (always). The measure includes questions that involve the infant's ability to communicate needs and regulate using emotional signals. The number of questions asked depends on the age of the infant. Sample items include: "Does your child turn towards sounds?," "Does your child point to items she or he wants?," and "Are you able to help your child calm down?"

The cognitive assessment of the *Bayley Scales of Infant Development – Third Edition* is used to determine the cognitive level of the infant. As a standardized measure, it was used to assess the cognitive ability of the participants in comparison to infants nationally. The starting task depended on the age of the infant, including months and days. The researcher, with the assistance of the mother and interpreter, administered items to the infant. For each task the infant was given either a 0 (did not complete) or a 1(completed). If the infant did not complete one or more of the first three start tasks, she or he was administered tasks designed for a younger age. When the infant failed to complete five tasks in a row, the assessment was complete.

Data Analysis Plan

First, participants were examined for missing data. Second, analysis of variance and correlations were used to examine the relation of categorical and continuous variables, respectively with outcome variables. If significant associations emerged, those demographic variables served as covariates in the main analyses. Finally, regression analyses were utilized to examine the direct and indirect (through maternal depressive symptoms) links between post-migration stressors and both infant cognitive and social-emotional development using the computational tool PROCESS (Hayes, 2013). Figures were created to illustrate the interaction by depicting the regression lines of the association between predictor (i.e., post-migration living difficulties) and outcome (i.e. infant cognitive and social-emotional development) (Hayes, 2013).

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Results

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Preliminary analyses

Across all relevant variables, data were missing for three participants. A Little's MCAR test (Little, 1988) revealed that data were missing completely at random, χ^2 (6) = 2.99, p > .10. Thus, listwise deletion was used for all analyses performed. Prior to analyses, parent ethnicity was dichotomized based on sample size in groups and inspection of the means. Ethnicity was dichotomized to Nepali/Bhutanese (0) or another ethnicity (1) (e.g., Somali Bantu, Congolese). Means, standard deviations, ranges, and bivariate correlations for all study variables are included in Table 1. Results showed that none of the demographic variables were significantly associated with social-emotional development. Cognitive development was significantly related to parent education level and ethnicity, such that infants from families with lower maternal education, F (2, 35) = 7.4, p < .01, and Bhutanese/Nepalese origin, F (1, 36) = 13.3, p < .01, exhibited lower infant cognitive development. Therefore, when infant cognitive development, but not infant

social-emotional development, served as the main dependent variable, both parent education and ethnicity served as demographic covariates.

The mean for post-migrations stressors suggested a moderate overall level whereas the mean for depressive symptoms suggested an overall relatively low level. The percentiles for cognitive and and social-emotional development were found to be slightly above the average (50th percentile) for both scales (M=59.10, SD=35.47; M=51.67, SD=31.67). In regard to bivariate correlations, post migration stressors were significantly and positively associated with parent depressive symptoms, but not infant cognitive or social-emotional development. Parent depressive symptoms were not significantly correlated with infant cognitive or social-emotional development. Lastly, infant cognitive and social-emotional development were positively correlated.

Primary Analyses

See Figures 1 and 2 for results from the social-emotional and cognitive indirect effects models, respectively. Regarding both the cognitive and social-emotional models, post-migration stressors were positively related to maternal depressive symptoms, b = .13, 95% CI [.04 to .23], R^2 = .19, p < .01, with higher levels of post-migration stressors being associated with higher levels of maternal depressive symptoms. Regarding the social-emotional model, neither post-migration stressors, b = -.11, CI [-.45 to .24], p > .10, nor maternal depressive symptoms, b = -.07, CI [-1.1 to 1.1], p > .10, were significantly related to infant social-emotional outcomes, R^2 = .02, p > .10. Regarding the cognitive model, neither post-migration stressors, b = -.11, CI [-.52 to .31], p > .10, nor maternal depressive symptoms, b = -.84, CI [-2.1 to .38], p > .10, were significantly related to infant cognitive development. In regard to the covariates, maternal ethnicity, but not education, was significantly related to infant cognitive development, b = 27.6,

CI [5.6 to 49.7], $p < .01$, with Bhutanese/Nepalese ethnicity being associated with lower social-emotional scores than "other" ethnicities. The indirect effect of post-migration stressors on social-emotional or cognitive outcomes through maternal depressive symptoms was not significant, $p > .10$, for either outcome.

Discussion

The purpose of this study was to determine the relationship between post-migration stressors and infant development with depressive symptoms as the mechanism by which this relationship could be explained. Building from Family Stress Theory (McCubbin, 1993) and a family systems perspective (Cox & Paley, 1997), it was hypothesized that higher levels of post-migration stressors would be directly and indirectly associated with lower levels of infant development. In terms of the indirect association, post-migration stressors were proposed to be related to high depressive symptoms and, in turn, higher depressive symptoms were proposed to be associated with lower cognitive and social-emotion development. Findings failed to support the hypotheses, as post-migration stressors were not related to infant cognitive or social-emotional development. Furthermore, the proposed indirect pathway through depressive symptoms also was not supported, as maternal depressive symptoms were not related to infant cognitive or social-emotional development. One link in the model was supported as higher levels of post-migration stressors were associated with high levels of maternal depressive symptoms.

Previous research supports the current finding that post-migration stressors are related to stress reactions, such as depressive symptoms (Ekblad et al., 1999; Samarasinghe & Arvidesson, 2002). However, the failure to find support for the proposed direct and indirect pathways is inconsistent with previous research. Studies have shown that depressive symptoms and life stressors are linked to infant development (Conroy et al., 2012; Kingston et al., 2012). There are

a variety of reasons why the direct and indirect pathways may not have been supported. First, this study involved refugees and asylum seekers and the Bayley Scales of Infant Development (BSID) was originally standardized for United States children (Steenis, Verhoeven, Hessen, & van Baar, 2015). Only one previous study has used the BSID to examine refugee infant development. However, this study differed from the current study in that it looked at older infants (ages 18 to 42 months) and analyzed pre-migration trauma (van Ee, Kleber, & Mooren, 2012). Prior studies using the BSID have examined the applicability of using the BSID with other cultures. Steenis et al. (2015) used norms for the Dutch version of the BSID and compared them to US norms to determine if population-specific norms are needed. After examining almost 2000 infants and toddlers, Steenis et al. (2015) determined that the Dutch norms differed significantly from the US norms when looking at all subtests and that population specific norms are necessary in order to compare data from a variation of cultures. Other studies have also supported the need for culture-specific norms for the BSID as well (Cromwell et al., 2014; Lohaus et al., 2014). Due to the repeated concerns shown throughout the literature involving the applicability of the BSID to other cultures, it is possible that the BSID was not accurately assessing the cognitive and social-emotional development of the infants in this study.

Another factor that may have influenced this study is that many of the participants had experienced some degree of trauma before entering the United States. Trauma history has previously been linked to poor parent-child interactions, such that mothers with higher levels of posttraumatic stress symptoms have been shown to have increased levels of insensitive, unstructured, and hostile interactions with children (van Ee, Kleber, & Mooren, 2012). This style of interaction has been shown to be detrimental to infant development, in particular placing children at risk of emotional and behavioral issues (Carter, Garrity-Rokous, Chazan-Cohen,

Little, & Briggs-Gowan, 2001; Yoshikawa, 1995). It is possible that trauma history had a stronger relationship to infant development than maternal depression or post-migration stressors.

The Post Migration Living Difficulties Checklist is an additional factor that could have had an influence on the results. The PMLD was first created to evaluate the stressors for a specific ethnic group in Australia (Silove et al., 1998). The version that was used in the current study was modified for Sweden immigrants and refugees (Dunlavy, 2001). The majority of the refugees in the current study were Bhutanese/Nepalese and the PMLD has previously been used in only one study to measure post-migration stressors in this specific population (Ellis et al., 2015). There is a lack of research focusing on similar populations to this study and post-migration stressors. As a result, the PMLD may not be a valid questionnaire to evaluate post-migration stressors for this specific population.

Several additional aspects of this study should be noted. First, mother depressive symptoms were relatively low and infant development was on average above the 50th percentile for both outcomes assessed. This suggests that both the mothers and their infants are functioning within normal ranges. Clinically, this is an encouraging finding. Continued assessment of both mothers and infants would allow researchers to assess if problems emerge as infants increase in age. Second, not surprisingly, mothers who had lower education levels had infants with lower levels of cognitive development. This finding suggests the importance of furthering the education of mother refugees. The strong negative relationship between Bhutanese/Nepalese origin, versus other origins (e.g. Iraqi, Somali-Bantu), and infant cognitive development suggests mothers from these origins should receive particular emphasis for educational opportunities.

There are several limitations of this current study that must be addressed. First, random recruitment was not possible, due to the way in which the participants were informed about the

study. Interpreters chose who to contact for the study, which attributed to the high participation of one ethnicity in particular (Bhutanese/Nepalese). Due to the lack of diversity in terms of ethnicity within the study, the findings cannot be generalized to all ethnicities. Second, the sample size was limited, as there were only 40 mothers. It is possible that relationships may emerge as more participants partake in the broader study.

Third, as a result of language barriers, interpreters were used for the majority of visits. Some items may have not been interpreted exactly as they were intended, which could have had an influence on participants' answers. Fourth, it is also possible that the use of interpreters could have resulted in limited disclosure, although this is unlikely as most of the participants were familiar with the interpreters through the community. Fifth, infant assessment may have occurred prior to delays in development. For example, the Conroy et al. (2012) study, which found support for a relationship between maternal depressive symptoms and infant development, assessed infants at a later age than used in the current study (18 months vs. 4-12 months). Finally, only associations can be determined between variables and not the causality of relationships, due to the data being cross-sectional (Kazdin, 2007). Longitudinal data are necessary in order to properly test maternal depressive symptoms as a mediator of the link between post-migration stressors and infant development.

Despite the limitations, this study was the first to look at post-migration stressors of refugee mothers and the association with their infant's development. Post-migration stressors were shown to have a direct impact on the depressive symptoms of refugee mothers, which highlights the importance of designing interventions focused on post-migration stressors and the impact these stressors can have on individuals. Although neither post-migration stressors nor maternal depressive symptoms were related to infant development, the current study is important

because it focused not just on mothers, but on their young offspring. Future research eliminating the limitations of this study (which were noted above) may find significant associations among the variables of interest. If this occurs, then the current study will have served an important function in promoting research with an underserved population.

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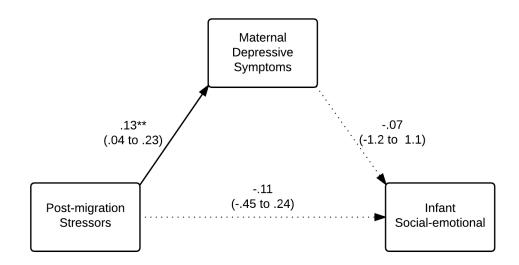
Table 1.

Descriptive statistics and correlations among primary variables

	M(S.D.)	Range	2	3	4	5	6	7	8
1. Post-Migration Stressors	23.74 (19.6)	0-108	.44**	0.14	-0.13	.41*	.52**	0.08	.59**
2. Depressive Symptoms	4.72 (6.2)	0-20	--	-0.13	-0.09	0.17	0.27	-0.15	0.32
3. Cognitive Development	106.97 (22.0)	55-145		--	.37*	0.07	0.07	.50**	.52**
4. Social Development	101.32 (17.6)	55-145			--	-0.18	-0.05	-0.03	0.16
5. Maternal age	29.98 (5.9)					--	.50**	-0.02	.35*
6. Number of Children	2.59 (1.9)						--	-0.16	.54**
7. Maternal Education	--	0-3						--	.44**
8. Maternal Ethnicity	--	0-1							--

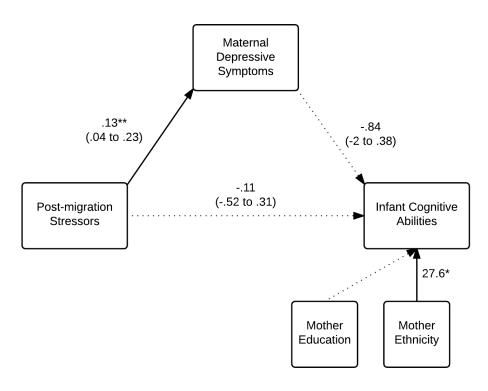Note: * $p < .05$, ** $p < .01$

Figure 1.

Social-emotional model.

Note: Significant paths in bold, non-significant paths as dashed lines.

Figure 2.

Cognitive model.

Note: Significant paths in bold, non-significant paths as dashed lines.