HHS Public Access

Author manuscript

J Am Psychiatr Nurses Assoc. Author manuscript; available in PMC 2015 June 13.

Published in final edited form as:

J Am Psychiatr Nurses Assoc. 2011 ; 17(4): 283–296. doi:10.1177/1078390311408900.

Pre-migration persecution, post-migration stressors and resources, and post-migration mental health: A study of severely traumatized U.S. Arab immigrant women

Anne E. Norris, PhD, RN, FAAN* **[Professor]**,
College of Nursing, University of Central Florida, Orlando, FL

Karen J. Aroian, PhD, RN, FAAN [Professor, Director of Research], and
College of Nursing, University of Central Florida, Orlando, FL

David Nickerson, PhD
Dept of Statistics, College of Sciences, University of Central Florida, Orlando, Florida

Abstract

Background—Competing theories exist regarding the importance of pre-migration trauma as compared to post-migration stressors and resources with respect to the risk to immigrant mental health.

Objective—To examine how type of pre-migration trauma, post-migration stressors, and post-migration resources differentially predict PTSD and MDD symptomatology in Arab immigrant women who have been exposed to pre-migration trauma.

Design—Descriptive; using multinomial logistic regression to explain membership in one of four groups: (a) PTSD only (n = 14); (b) major depressive disorder (MDD) (n = 162), (c) Co-Morbid PTSD-MDD (n = 148), (d) Subclinical Symptoms (n = 209).

Results—Post-immigration related stressors (as measured by the Demands of Immigration (DI)) had the strongest effect: Parameter estimates indicated that a unit increase in DI scores was associated with a nearly 17 fold increase in the likelihood of being in the Co-morbid relative to the Subclinical group, and a nearly 2.5 increase in the likelihood of being in the Co-Morbid relative to the MDD only group ($p < .05$). Social support, age and type of pre-migration trauma had smaller effects and only differentiated between Subclinical and Co-Morbid PTSD-MDD groups ($p < .05$).

Conclusion—Post-migration stressors exert substantive effects on immigrant mental health outcomes. Nursing interventions are needed to reduce immigration related stressors. Screening Arab immigrant women for depression and PTSD is important given high levels observed in this community based sample.

Immigrants who experience trauma in their country of origin prior to immigration are at risk for post-traumatic stress disorder (PTSD) and major depressive disorder (MDD; e.g., Robjant, Robbins, & Senior, 2009). However, competing theories exist regarding the

*Corresponding author address and contact information: College of Nursing, University of Central Florida, 12201 Research Parkway, Rm 452, Orlando, FL 32826-3265, Phone: 407-823-4185, Fax: 407-823-5675, anorris@mail.ucf.edu.

importance of pre-migration trauma as compared to the post-migration period with respect to the causes of these illnesses. Beiser (1999, 2006) has theorized that post-migration stress and social resources have a greater impact on the risk for mental illnesses than pre-migration experiences, arguing that what occurs during the post-migration period is far more important with respect to psychopathology than pre-migration trauma. However, Beiser does not take into consideration the type of trauma. Ebert and Dyck (2004) argue that trauma which is persecutory in nature, such as torture, has the potential to engender PTSD as well as MDD (Ebert & Dyck, 2004).

The purpose of this paper is to examine how type of pre-migration trauma, post-migration stressors, and post-migration resources differentially predict PTSD and MDD symptomatology in Arab immigrant women who have been exposed to pre-migration trauma. Findings will clarify how much emphasis nurses should give to the pre and post-migration time periods during an assessment, whether type of pre-migration trauma assists with making differential diagnoses, and whether post-migration is a critical period for nursing intervention. A better understanding of these issues is critical for psychiatric nurses to develop, target, and time interventions that promote the mental health of immigrants.

PTSD, MDD, and Co-morbidity

Individual responses to trauma are varied. PTSD is but one potential long-term outcome that can manifest after exposure to a traumatic event (Yehuda, McFarlane, & Shalev, 1998). Additional possible outcomes include MDD without PTSD (e.g., Chapman, Whitfield, Felitti, Dube, Edwards, & Anda, 2004) as well as the co-morbidity of PTSD and MDD (e.g., Breslau, Davis, Peterson, & Schultz, 2000; Brown, Campbell, Lehman, Grisham, & Mancill, 2001). However, many individuals who are exposed to a traumatic event never develop PTSD or MDD (Yehuda, Halligan, Golier, Grossman, & Bierer 2004).

The factors contributing to differential responses to trauma are not well understood. In fact, there are contradictory findings. Research suggests that some aspects of HPA axis regulation in co-morbid PTSD-MDD are distinctly different from what is seen in “pure” MDD and “pure” PTSD (de Kloet, Vermetten, Lentjes, Geuze, van Pelt, Manuel, et al. 2008; Vythilingam, Gill, Luckenbaugh, Gold, Collin, Bonne, et al. 2010). Moreover, research regarding the sleep structure of individuals with PTSD, and co-morbid PTSD-MDD argue for more and different types of sleep disturbances in the latter group (Yetkin, Aydin, & Özgen, 2010). However, De kloet, et al (2008) conclude that symptom levels in these two groups are not sufficiently different to argue for co-morbid PTSD-MDD being distinctly different from PTSD. Their conclusions are consistent with research regarding individual differences in HPA axis regulation of cortisol levels and the DSM-IV field trial (Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). Their findings argue for MDD and PTSD representing two different biological responses to trauma (Yehuda, McFarlane, & Shalev, 1998), and for the differences between those who present with PTSD and those who present with co-morbid PTSD-MDD being small (Yehuda, et al, 2004), suggesting that co-morbid PTSD-MDD is a subtype of PTSD.

However, none of the research regarding PTSD-MDD comorbidity has focused on immigrants who have experienced persecution (e.g., torture). Pre-migration trauma are often of a persecutory nature and immigrants' escape from persecution is typically followed by an intensive period of adjustment to a new country (Beiser, Turner, & Ganesan, 1989). As will be discussed next, there are theories and some evidence that suggest these considerations are important in determining whether individuals develop PTSD, MDD, or comorbid PTSD-MDD.

Predictors of Diagnostic Group Membership

Type of trauma clearly plays a role in the diverse pattern of responses to trauma: Traumatic experiences that include torture are associated with the highest incidence of PTSD (Yehuda, et al, 1998). Research documents this increased risk for PTSD in a variety of populations who have experienced torture, including Algerians, Ethiopians, and Gazans (WHO epidemiological survey, de Jong, Komproe, Ommeren, Masri, et al, 2001), Tibetan refugees (Holtz, 1998), Chilean and Salvadoran immigrants (Thompson & McGorry, 1995), and Vietnamese ex-political detainees (Mollica, McInnes, Pham, Fawzi, Murphy, & Lin 1998). This increase in the risk of PTSD has been observed even after controlling for demographic variables (Shrestha, Sharma, Van Ommeren, Regmi, Makaju, Komproe, Shrestha, & de Jong, 1998) and the effects of war and multiple trauma (Silove, Steel, McGorry, Miles, & Drobny, 2002).

According to Ebert and Dyck (2004), torture has great effects on psychopathology because it combines persecution with totalitarian control and organized violence. This combination potentially destroys trust and faith in humankind. Ebert and Dyck theorize that such experiences can create a loss of core beliefs and values, a sense of alienation, and an altered world view. These effects in turn increase the risk for both PTSD and depression symptoms (hopelessness, guilt, shame). Additionally, the self-in-relation to others is damaged, contributing to a social isolation which makes it difficult for the individual to participate in intimate relationships, further increasing the risk of developing MDD in addition to PTSD. Thus, we speculate that pre-migration experiences involving persecution (e.g., sectarian violence, torture) carry over and shape the post-migration period in ways that increase the risk for co-morbid PTSD-MDD.

Beiser's (1999) position that the post-migration period has a far greater impact on immigrant mental health than pre-migration trauma is based on his longitudinal qualitative work with Asian immigrants. His position is also supported by ample studies that document a strong relationship between immigrant demands (e.g., loss, not feeling at home, novelty, occupation, language, and discrimination) and mental health outcomes (Aroian, Norris, Tran, & Schappler-Morris, 1998; Steel, Silove, Bird, McGory, et al., 1999; Tracy, 1999; Kimerling et al., 2004).

Beiser further asserts that the characteristics immigrants bring with them can mitigate risks to mental health and there is ample evidence that supports this assertion (Marsella, Friedman, Matthew, Spain, & Huland, 1996). For example, stress, an older age, and low education were all found to predict depressive symptoms in elderly Arab immigrants

(Wrobel, Farraq & Hymes, 2009). However, none of this research has compared the relative impact of pre-migration trauma with these post-migration variables.

Social support has also been identified as a powerful protective factor with respect to immigrant mental health (Al-Issa, 1997; Beiser, 2006), particularly with respect to depression (Chou, 2009; Kuo, Chong, & Joseph, 2008). Social support appears to decrease the risk for depression in elderly women immigrants (e.g., Kuo, et al; Miller, Sorokin, Wang, Feetham, Choi, & Wilbur, 2006), as well as the risk for post-partum depression in younger women immigrants (e.g., Small, Lumley, & Yelland, 2003). However, the evidence linking social support to a decreased risk for PTSD is limited.

Arab immigrant women living in the US are an optimal group for investigating the effects of pre-migration persecution related trauma, and post-migration stressors and resources. Many of these women are from war-torn countries and have been persecuted because of political affiliation and ethnic/religious background (Jamil, Hakim-Larson, Farrag, Kafaji, Duqum, et al, 2002; Jamil, Hakim-Larson, Farrag, Kafaji, Jamil, et al, 2005). For example, Arab immigrants from both Lebanon and Iraq have firsthand experience with war and those from Iraq have also suffered sustained and systematic persecution during Sadam Hussein's regime (Jamil, Nassar-McMillan, & Lambert, 2007).

Post-migration, Arab immigrant women may be the target of discrimination (Human Rights Watch, 2002; Naber, 2006), or experience other immigration related stressors (Wrobel Farrag, & Hymes, 2009). Arab women also have traditional cultural values that are more likely to be discordant with those in their host communities within the US, making adjustment more stressful (Al-Khawaja, 1997; Dwairy, 2006; Haddad & Smith, 1996).

The study that follows investigated the importance of type of trauma and post-migration stressors (immigration demands), resources (e.g., social support), demographic characteristics (education, youth) to the mental health of traumatized Arab women immigrants. The specific aims were to examine whether type of pre-migration trauma (persecution, e.g., torture), post-migration stressors (e.g., demands of immigration related to loss, not feeling at home, novelty, occupation, language, and discrimination), demographic characteristics (e.g., age, education), and social support are differentially predictors of diagnostic group membership (PTSD, MDD, co-morbid PTSD-MDD, subclinical symptoms).

Methods

Sample

Study participants were a subsample of Arab Muslim immigrant women living in metropolitan Detroit who were part of a larger study on mother – adolescent adjustment (Aroian, Hough, Templin, Kulwicki, Ramaswarmy & Katz, 2009). The subsample was selected from the larger study based on their endorsing having experienced one or more types of pre-migration trauma from Section 1 of the Posttraumatic Diagnostic Scale (PDS; Foa, 1995). This selection criterion yielded 519 study participants (81.6% of full sample). A majority of the resulting sample (72.5%) reported living through or witnessing three or more

traumatic events. The most commonly reported types were military combat or war zone (92.9%); serious accident, fire, or explosion (70.9%); imprisonment (48.4%); life-threatening illness (39.5%); torture (37.8%); and natural disaster (31.4%). Very few (2.6%) reported experiencing physical or sexual assault not related to war or political/ethnic persecution.

The mean age of the sample was 40.22 (*SD* = 6.50) years with a range of 26.84 to 34.97 years. Most participants were married (84.6%). These characteristics reflect the fact that only women with one or more adolescents were eligible for participation in the larger study. Over half (54.1%) of the sample was born in Iraq and a third (33.1%) was born in Lebanon. The remaining 12.8% were born in 1 of 12 other Arab countries in the Middle East or Northern Africa. Median length of time living in the U.S. was 9.26 years. More had entered the U.S. as refugees (54.1%) or immigrants (38.3%), with only 7.5% entering on tourist, student, or work visas before seeking permanent residence. Only 18.8% spoke English. Almost two thirds (65.1%) had less than a high school education and only 9.3% had a college degree. The majority were homemakers who were not looking for work (96.3%). Only 16.2% were employed full or part-time. Of the 426 women who had husbands currently in the home (i.e., not widowed, divorced, or separated), 52.1% of their husbands were employed either full or part time. Almost half (43.5%) of the husbands had less than high school education, but 18.1% had a college degree.

Procedure

After receiving IRB approval from the university affiliated with the study, participants were recruited through verbal advertisement by bilingual research assistants who were also immigrants and representative of the countries of origin in the local Arab community. They could choose to be interviewed in English or Arabic, with almost all choosing Arabic (97%). Informed consent and data collection occurred in study participants' homes. Bilingual research assistants verbally administered the measures. Every participant was given a list of Arabic-speaking mental health professionals to contact if they wished, but stronger recommendations were given to participants who exhibited high levels of distress. Participants were given $30.00 for their time.

Measures

Arabic language versions of study measures were developed through translation and back translation as a validity check, and further evaluated by committee consensus. The goal of the translation work was loyalty of meaning and equal familiarity and colloquialness in both languages (Werner and Campbell, 1970). Only measures used in the analyses reported here are described next. Age (youth) and education were captured using items from the study demographic and migration questionnaire.

Age was calculated using birth and interview dates. Education was dichotomized as less than high school (0, includes no education) and high school, its equivalent, or greater (1).

The Center for Epidemiology Screen-Depression (CES-D; Radloff, 1977) was used as a proxy measure for meeting diagnostic criteria for Major Depressive Disorder (MDD). The

CES-D assesses the presence of 20 depressive symptoms, based upon how respondents felt during the past week. Items are scored from 0 (*rarely*) to 3 (*most of all of the time*) with a high score reflecting increased depressive symptomatology. Validity is supported and reliability coefficients are high (Cronbach's *alpha* = .90) among general population samples (Radloff, 1977). Validity and reliability (*alpha* = .91) is supported for the Arabic language version used for the analyses presented here (Aroian, Kaskiri, et al, 2008; Ghubash, et al, 2000). For example scores on the CES-D were correlated with scores on the Profile of Mood State (POMS) subscale Depression/Dejection (r = .81; Aroian, Kulwicki, Kaskiri, Templin, & Wells, 2008). Cronbach's *alpha* was .91 in this study sample.

A CES-D score of 16 can be used to estimate the prevalence of Major Depressive Disorder in a given population (Radoff, 1977). Support for use of this cutscore in an Arab sample is provided by Ghubash, Daradkew, Al Naseri, Al Bloushi, and Al Daheri (2000) in their study of college age Arab women living in the Middle East. Ghubash et al, found that 82% of those scoring above the cut-off were correctly classified as having MDD. Thus, individuals scoring 16 or higher on this measure in this sample were classified as having MDD for purposes of the study analyses.

The Posttraumatic Diagnostic Scale (PDS; Foa, 1995) was used as a proxy measure for meeting diagnostic criteria for PTSD (see also Table 1). The PDS is comprised of four sections. Section II, which asks which event has disturbed you the most in the past month, was not used and is not described here.

Section I of the PDS contains a checklist of traumatic events. Respondents indicate whether they have experienced or witnessed each of these events or use the "other" category to write in events not included in the checklist. Traumatic events reported in Section I were used to categorize participants as having experienced a persecution type trauma (yes, no). Persecution type trauma was defined as torture or witnessing a family member being tortured, imprisonment, and/or home invasion. Non-persecution trauma was defined as war related or natural disaster related trauma.

Section III contains 17 items that assess the PTSD symptoms of Re-experiencing, Avoidance, and Arousal. The frequency of each symptom's occurrence in the past month is rated on a four point scale, ranging from 0 (not at all or only one time) to 3 (five or more times a week or almost always). Reliability is excellent for both English (Foa, 1995) and Arabic (Norris & Aroian, 2008) language versions (Cronbach's *alpha* = .93). Validity of the Arabic language version is supported by factor analysis and replication of the pattern of correlations obtained by Foa (e.g., correlations with measures of depression (r = .66) and stress (r = .55); Norris & Aroian, 2008). Cronbach's alpha was .93 in this study sample.

Section IV assesses general satisfaction with life, functioning overall, and functioning in different life domains – work, home, family, etc. It contains nine items for which the response options are yes or no.

Zimit, Dahlem, Zimet, and Farley's (1988) Multidimensional Scale of Perceived Social Support is a 12 item measure that assesses social support in three domains (friends, family, and significant others). Each item is rated along a 7-point scale ranging from *very strongly*

disagree (1) to *very strongly agree* (7). For use with an Arab population, scale items that referred to "significant other" were modified to refer to "husband" because intimate or romantic relationships are only permissible between women and their spouses (Haddad & Smith, 1996). Items referring to family specified that they pertain to "family other than your spouse" to capture support from extended family. Extended family is an important source of support for Arabs and typically differs in form and function from spousal support (Kulwicki, 1996; Shryock, 2000). A total scale score is computed by summing the items responded to and dividing this sum by the number of items completed, allowing women who do not have a husband to have a total score based on the items that they completed. Internal consistency reliability (*alpha* = .74 (total scale)) for the Arabic language version (Aroian, Templin, & Ramaswamy, 2010) and original English version of total scale is satisfactory (e.g., Dahlem, Zimet & Walker, 1999; Kazarian & McCabe, 1991; Zimet, et al, 1988). Support for the validity of the Arabic language version is demonstrated by replication of the original factor structure and the pattern of correlations between the subscales and emotional distress, types of hassles, and coping behaviors (Aroian, et al, 2010). Cronbach's *alpha* for the total scale was .75 in this study sample.

The Demands of Immigration Scale (DI) is a 23- item measure that elicits information about immigration stressors related to loss, not feeling at home, novelty, occupation, language, and discrimination (Aroian, et al, 1998). Respondents rate, along a 6-point scale ranging from 0 (*not at all*) to 5 (*very much*), the extent to which they have been distressed by each of the stated demands as it applies to their recent (within the last 3 months) personal experiences as immigrants. Higher scores represent greater immigration demands. Reliability and construct validity of the DI Scale have been established with Russian (Aroian et al., 1998) and Arab immigrants (Aroian, Kaskiri, & Templin, 2008). Confirmatory factor analysis supports a six-factor as well as higher, single-factor model. The correlation between the DI and DeLongis, Folkman, and Lazarus (1988)'s Daily Hassles scale (r = .65) in the current study population provides additional support for validity of the measure (Aroian, et al., 2008). Although the DI measures subjective distress, the measurement model developed via confirmatory factor analysis for the larger study confirmed that the DI is conceptually distinct from the CES-D (Aroian et. al., 2009). Cronbach's *alpha* for the Arabic language version of the DI was .86 for total scale in this study sample.

Data Analysis

First, participants were classified into one of four groups on the basis of their responses to the PDS and CES-D: Subclinical, PTSD, MDD, or Co-Morbid PTSD-MDD. The term "Subclinical" was used because these women tended to have symptoms, but not at a sufficiently high enough level to be consistent with what would be seen in MDD or PTSD.

Second, multinomial regression analysis was used to investigate whether trauma type, post-migration stressors (e.g., demands of immigration related to loss, not feeling at home, novelty, occupation, language, and discrimination), demographic characteristics (e.g., age, education), and social support differentially predict diagnostic group membership (PTSD, MDD, comorbid PTSD-MDD, Subclinical). The Co-Morbid PTSD-MDD was used as the

reference group in this analysis. There was no evidence of multicollinearity (largest correlation between the independent variables was −.21)

The multinomial regression analyses reported here were conducted with and without controlling for length of time in the United States. Inclusion of the length of time in the US in any of these analyses had little or no effect on the magnitude or significance tests of the regression coefficients (i.e., did not substantively alter them). Hence results of these additional analyses are not reported here.

The stability of the parameter estimates, despite the small size of the PTSD only group, is supported by similarities in the coefficients produced when the PTSD only group was alternatively included and excluded from the analyses. However, the small size of the PTSD only group limits the sensitivity of the parameter tests for comparisons involving the PTSD only group (the standard error for this group is very large due to its small size). This increases the risk for Type II error with respect to these comparisons.

Results

As can be seen from the descriptive statistics in Table 2, more than half (57.03%) of the sample had scores above 16 on the CES-D. Almost half (45.27%) of women with CES-D scores above 16 (25.82% of the total sample) had PDS scores consistent with PTSD. Less than 5% of the study sample had PDS scores consistent with PTSD but CES-D scores inconsistent with MDD.

All predictor variables with the exception of education (Wald Chi-Square = 5.66, $df = 3$, $p = .13$) were significant in the multinomial regression analyses. Post-immigration related stressors (as captured by the Demands of Immigration measure) had the strongest effect in the analysis (Wald Chi-Square = 72.90, $df = 3$, $p < .0001$), followed by social support (Wald Chi-Square = 19.91, $df = 3$, $p < .001$). Both age (Wald Chi-Square = 9.60, $df = 3$, $p < .05$) and exposure to trauma involving persecution (Wald Chi-Square = 8.93, $df = 3$, $p < .05$) had significant but smaller effects.

The parameter estimates and odds ratios (ORs) for each group compared against the Co-Morbid PTSD-MDD reference group are depicted in Table 3. Inspection of these estimates and ORs indicates that a unit increase in the Demands of Immigration score is associated with a nearly 17 fold increase in the likelihood of being in the Co-Morbid group relative to the Subclinical group, and a nearly 2.5 increase in the likelihood of being in the Co-Morbid group relative to the MDD only group relative to the. Both of these effects remained significant after applying a Bonferonni correction ($p < .05$).

Parameter estimates for Social Support indicate that each increment in the Social Support score, the odds of being in the subclinical group and the PTSD only group relative to being in the Co-Morbid group increase by a factor of 1.4 to 1.5 ($p < .05$; see Table 3). However, only the estimate comparing the Subclinical group remained significant after applying a Bonferonni correction ($p < .05$).

Findings in Table 3 also indicate that experiencing a trauma involving persecution in the pre-migration period appears to more than double the odds of being in the Co-Morbid group relative to the Subclinical group. This type of trauma experience also appears to nearly double the odds of being in the Co-Morbid relative to the MDD only group ($p < .05$). However, only the former estimate comparing the Subclinical group remained significant after applying a Bonferonni correction ($p < .05$).

Consistent with a protective effect for youth, age appears to increase the odds of having Co-morbid PTSD-MDD relative to being in the Subclinical or MDD only group. However, this effect is only significant for the Subclinical group after a Bonferonni correction. The small ORs for age (ORs are close to 1) and the small Wald Square (Wald Chi-Square = 9.60, $df = 3$, $p < .05$) for the overall effect of age are both consistent with the small differences in mean ages shown in Table 4.

Discussion

This study examined the impact of type of trauma experienced during the pre-migration period, and post-migration stressors and resources on PTSD and MDD symptomatology in Arab immigrant women living in the United States. Study findings support Beiser's (1998) argument as to the importance of the post-migration period to immigrant mental health. Immigration related stressors were strongly associated with being in the Co-Morbid PTSD-MDD group relative to the Subclinical symptom group. Type of trauma did increase the odds of being in the Co-Morbid relative to the Subclincal Symptoms group. However, the odds ratios for immigration related stressors were much larger than that observed for pre-migration trauma that involved persecution. Thus our findings replicate qualitative (e.g., Beiser, 1999) and quantitative findings (e.g., Steel, et al, 1999) in the literature regarding the impact of post-migration stressors and they extend these findings by quantifying the impact of immigration related stressors in the context of pre-migration trauma and other post-migration resources.

Unfortunately, our ability to differentially predict PTSD and MDD symptoms was limited by the size of the PTSD only sample subgroup. The presence of high levels of PTSD symptoms in the absence of MDD symptoms was relatively rare in this sample of multiply traumatized Arab immigrant women. As a result our ability to detect differences between this group and the Co-Morbid PTSD-MDD group was underpowered. It is possible that lower levels of social support may differentiate between PTSD only and Co-Morbid PTSD-MDD symptomatology. This would mean that higher levels of social support protect against the development of high levels of MDD symptomatology which would be consistent with research and theory about role of social support in depression (e.g., Ayers, Hofstetter, Usita, Irvin, Kang & Hovell, 2009; Hovey & King, 1997; Kim, Han, Shin, Kim, & Lee, 2005). However, findings from the present study are inconclusive given the competing concerns of Type I and Type II error rates.

Our findings regarding the importance of resources (youth, education, social support) during the post-migration period are mixed. Consistent with previous research involving immigrants from other countries, we found that youth and social support decreased the risk

for mental health problems (i.e., decreased the odds of being in the Co-Morbid PTSD-MDD group). However, contrary to past research, we found no significant effects for education.

Our participants tended to have limited ranges for education (the majority had less than a high school level of education) and age (26.84 to 34.97 years). This may have impeded our ability to detect effects for both of these variables. It is possible that both education and youth may play a more protective role in groups where there is a broader range for these variables.

There are at least three potential explanations for the small effect for social support that we observed here. First, the lack of a strong effect for social support may reflect the lesser importance of this variable in the context of other variables included in our analyses (immigration demands, persecution, etc.). Second, the small effect we obtained for social support may argue for better measures of social support. It is possible that the measure we used did not fully capture social support or those aspects of social support that are relevant to MDD and PTSD psychopathology. Third, it is likely that the social support system available for these women was comprised of individuals who were similarly traumatized and thus unable to serve as an effective resource. Considering the language barriers and the size of the ethnic enclave in the city of Detroit where these women lived, it is probable that their social support system consisted of other Arab immigrant women. The high reports of traumatic experiences in the full study population from which this study subsample was drawn, and the high incidence of depression and PTSD noted in this subsample argue for the last explanation. Thus, we are reluctant to conclude on the basis of these study findings alone that social support is not an important variable to study in the context of trauma exposed Arab immigrant women's post-migration mental health.

This study has at least three limitations. First, these data are cross-sectional. It is unclear how current mood states impacted reporting of past events or current levels of stress. Therefore, replication of these findings with longitudinal data is needed.

Second, all of our study participants were Arab women, and the majority of this sample was married. Hence, our study results are not directly generalizable to Arab men and it is possible that these results would differ in a sample of widowed, divorced, separated or never married women as well as women from other cultural/ethnic groups. However, our results are consistent with those of Wrobel, et al (2009)'s findings of an effect for stress and older age on depressive symptoms in elderly Arab male and female immigrants. This suggests these findings may have some generalizability to elderly Arab immigrants.

Finally, and most importantly, we were not able to create our subgroups on the basis of formal diagnostic evaluations provided by a psychiatric clinician. Instead, we relied on self-report of symptoms. Also, our definition of individuals meeting symptom criteria for MDD was based on responses to a screening tool rather than a diagnostic measure. It is possible that the MDD group contained individuals who would not have met diagnostic criteria for MDD upon further clinical examination. If so, this would have biased the proportion we observed in the MDD group in a lower direction. However, the percentage of women who met symptom criteria for MDD and also reported symptom levels consistent with PTSD in

this study (45.3%) is similar to what was observed for women participants in the National Co-morbidity Study (48.5%, Kessler, Sonnega, Bromet, Hughes, & Nelson 1995). This provides some support for the validity of our findings, but clearly research is needed with community populations of immigrants that use formal diagnostic procedures to identify individuals with and without MDD, PTSD, and co-morbid PTSD-MDD. Specifically, more research is needed using (a) procedures such as a Structured Clinical Interview of DSM-I-R Mental Disorders (SCID; Spitzer, Williams, Gibbon, & First. 1990) to diagnose participants with MDD and PTSD, and (b) samples with larger numbers of individuals who meet diagnostic criteria for PTSD but not MDD. Such research would allow us to more conclusively rule out (or rule in) a link between persecution type trauma and co-morbid PTSD-MDD as compared to PTSD only symptomatology.

Despite these limitations, study findings have implications for theory, practice and research. With respect to theory, these findings argue for the importance of what happens after the trauma. Greater understanding is needed of the physiological mechanisms by which life stressors in the post-event period contribute to the development of PTSD and depression in immigrant populations with a trauma history.

With respect to practice, these findings argue for psychiatric nurses discussing post-migration experiences with their clients and teaching stress management skills. The post-migration period appears to be a critical period for nursing intervention with respect to immigration related stressors.

These findings also argue that psychiatric nurses should expect to treat Co-morbid PTSD-MDD more frequently than PTSD in isolation when working with immigrant clients with a trauma history. Unfortunately, it remains unclear whether type of trauma, particularly trauma involving persecution, is relevant to differentially predicting Co-Morbid PTSD-MDD from MDD or PTSD occurring in isolation.

These findings clearly argue for nurses to screen Arab immigrant women for depression and PTSD in primary care as well as psychiatric care settings. Slightly more than half of this sample had scores greater than 16 on the CES-D, and slightly more than a fourth appeared to meet the DSM IV-R symptom criteria for PTSD based on symptom self-report. However, these women were recruited from the community, not a clinical sample, suggesting it is important to screen Arab immigrant women at non-psychiatric health care encounters to ensure referral to appropriate treatment resources.

Finally, these findings identify directions for the research needed to guide nursing practice. Nursing interventions designed to support and assist patients in their management of immigration related stressors are clearly needed. Youth may be a protective factor, but our study findings suggest that the mental health of younger immigrants may be at risk in the context of immigration related stressors.

Our findings also underscore the need for more basic research regarding mental health and resilience. All of the women in this sample were at risk for depression and PTSD given their trauma history and the stressors associated with being an immigrant. However, not all of these women appeared to meet symptom criteria for these two illnesses. Slightly less than

half (41.4%) had CES-D and PDS scores that argued against their symptom levels being consistent with MSS or PTSD. We found substantive negative effects for immigration related stressors and a smaller positive effect for social support, but clearly other factors play a role beyond what was studied here. This argues for future research regarding biological and social factors that contribute to resilience in women who are at high risk for developing a mental illness due to their life circumstances.

Acknowledgments

This study was funded by a grant from the National Institutes of Health, NR 008504, to Dr. Karen J. Aroian.

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Table 1

Correspondence between Foa's (1995) PDS and the DSM-IV criteria for PTSD

Foa's (1995) PDS	DSM-IV Criteria for PTSD
Section I	Criterion A: A traumatic experience
Section II	Criterion B: At least 1 re-experiencing symptom Criterion C: At least 3 avoidance symptoms Criterion D: At least 2 arousal symptoms
Section III	Criteria F: Problems with functioning

Sections I, III, and IV of the PDS correspond to the DSM-IV criteria A, B, C, D, and F for PTSD (Foa, 1995). Responses can be used to determine if the following are present: (1) a traumatic experience consistent with criterion A (Section 1); (2) symptoms consistent with DSM criteria B (Intrusive Recollection (AKA Re-experiencing Symptoms)), C (Avoidant/Numbing Symptoms (AKA Avoidance Symptoms)), and D (Hyperarousal (AKA Arousal Symptoms), Section III); and (3) problems with functioning consistent with DSM criteria F (Section IV).

Table 2

Classification of symptom groups in study sample

		PTSD Criteria Met on PDS?		Row Totals: (*n* = 519)
		No	**Yes**	
CES-D responses consistent with MDD?	No	Subclinical	PTSD	
		40.27% (*n* = 209)	2.70% (*n* = 14)	42.97% (*n* = 223)
	Yes	MDD	Co-Morbid PTSD-MDD	
		31.21% (*n* = 162)	25.82% (*n* = 134)	57.03% (*n* = 296)
Column Totals: (*n* = 519)		71.48% (*n* = 371)	28.51% (*n* = 148)	

Table 3

Maximum Likelihood Estimates and Odds Ratios from multinomial regression.

Parameter[a]	Group	B	Std. Error	Odds Ratio (OR)	Significance[b]
Intercept	Subclinical	4.0062	1.0819	_ _ _ _	.0002*
	MDD only	3.3821	1.0117	_ _ _ _	.0008*
	PTSD only	−1.8330	2.8489	_ _ _ _	.5200
Age	Subclinical	−.0541	.0193	.947	.0050*
	MDD only	−.0402	.0180	.961	.0256
	PTSD only	−.0802	.0492	.923	.1028
Education	Subclinical	.5952	.2896	1.813	.0398
	MDD only	.6186	.2786	1.856	.0264
	PTSD only	.6571	.6137	1.929	.2843
Demands of Immigration	Subclinical	−2.7487	.3251	.064	< .0001*
	MDD only	−.8879	.2589	.412	.0006*
	PTSD only	−.8555	.6549	.425	.1915
Social Support	Subclinical	.3620	.1126	1.436	.0013*
	MDD only	−.0346	.0981	.966	.7244
	PTSD only	.6660	.3140	1.946	.0339
Trauma with Persecution	Subclinical	−.7830	.2721	.457	.0040*
	MDD only	−.5770	.2630	.561	.0281
	PTSD only	−.1490	.6339	.862	.8141

[a] Reference group is the Co-Morbid PTSD-MDD group.

[b] Asterisk indicates parameter is significant at $p < .05$ with Bonferroni correction.

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Table 4

Group values for study variables[a]

	Subclinical (n = 209)	PTSD (n = 14)	MDD (n =162)	Co-Morbid PTSD-MDD (n = 134)
Age	(n=200)	(n = 14)	(n =150)	(n = 131)
Mean	39.44 years	38.52 years	40.00 years	41.86 years
(SD)	(6.21)	(4.48)	(6.34)	(7.03)
Education	(n = 209)	(n = 14)	(n =162)	(n =134)
Less than High School (H.S.)	57.0%	64.3%	64.2%	79.7%
H.S. Grad., Equivalent or beyond	43.0%	35.7%	35.8%	20.3%
Demands of Immigration	(n = 209)	(n = 14)	(n = 157)	(n = 134)
Mean	.86	1.20	1.18	1.41
(SD)	(.40)	(.35)	(.47)	(.49)
Social Support	(n = 209)	(n = 14)	(n = 157)	(n = 134)
Mean	5.68	6.06	5.26	5.31
(SD)	(1.08)	(.99)	(1.24)	(1.34)
Trauma with Persecution	(n = 209)	(n = 14)	(n = 157)	(n = 134)
No (War Zone, Natural Disaster)	48.1%	28.6%	38.9%	26.3%
Yes (Persecution)	51.9%	71.4%	61.1%	73.7%

[a]Bonferroni corrected significance tests for parameter estimates in the multinomial regression indicate means and frequencies reported for the Co-Morbid PTSD-MDD group are significantly different from those reported for the Subclinical group for all study variables except Education ($p < .05$). In addition, these significance tests indicate that the mean Demands of Immigration scores for the Co-Morbid PTSD-MDD group are significantly different from those reported for the MDD only group ($p < .05$).