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Post-Migration Stress and Mental Health Outcomes: A Comparative Study of Syrian Refugee Women in Houston and Jordan

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Abstract: This study aims to examine context-specific post-migration stress factors and their differential impacts on the mental health of Syrian refugee women resettled in Houston, Texas, and urban communities in Jordan. A cross-sectional survey investigated sociodemographic and health-related conditions, psychological distress and coping (Perceived Stress Scale [PSS]), mental health-related symptomatology (Self-Report Questionnaire [SRQ]), conflict-related psychological distress (Afghan Symptom Checklist [ASC]), and post-migration stress (Refugee Post-Migration Stress Scale [RPMS]). Linear regression models examined factors associated with post-migration stress and mental health outcomes. A total of 127 Syrian refugee women participated in the study. Participants were in their mid-30s (mean age = 34.79 ± 11.2 years), married (66.9%), and reported low levels of education (44.8% below high school), low employment (27.2%), and elevated financial strain (91% below the poverty line). Jordan-based refugees exhibited higher scores on mental distress measures compared to their Houston-based counterparts; specifically more elevated psychological distress ($p < 0.001$), symptomatology ($p < 0.001$), and conflict-related distress ($p < 0.001$). Syrian refugee women in Houston reported higher social strain, while those in Jordan experienced greater financial hardship and barriers to accessing healthcare services. Mental distress among Syrian refugee women is influenced by specific post-migration stressors that vary by resettlement location. Targeted interventions are necessary to improve mental health outcomes in this population.

Keywords: women; mental health; post-migration stress; psychological distress; symptomatology

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1. Introduction

The Syrian conflict has created unprecedented challenges, especially in public health and social services, and has become one of the most significant humanitarian crises of the 21st century (Ferris et al. 2013; Karim and Islam 2016; Syam et al. 2019). Syrian refugees have sought asylum in neighboring countries, particularly Jordan, as well as in distant nations like the United States (U.S.) (UNHCR 2024a). Jordan has become the world's sixth

largest refugee-hosting nation and ranks second in hosting Syrian refugees. As of fiscal year (FY) 2024, over 650,000 refugees from Syria have sought refuge in Jordan, with many settling across the country's northern regions (UNHCR 2024b). Meanwhile, since the onset of the Syrian civil war, approximately 38,730 Syrian refugees have resettled in the U.S. between 2011 and 2023 (Migration Policy Institute 2023; USA FACTS 2024).

Considering the existing literature on post-migration stressors, multiple complex factors significantly influence refugee mental health outcomes. Perceived discrimination (Noh et al. 1999; Pascoe and Richman 2009), limited host-country language proficiency, and unemployment create significant challenges to the well-being of refugees (Beiser and Hou 2001; Hartmann et al. 2023). Family separation generates additional psychological strain (Schweitzer et al. 2011; Nickerson et al. 2010). Furthermore, systemic-level barriers should be acknowledged: the uncertainty of asylum applications (Chu et al. 2013; Laban et al. 2008; Nabulsi et al. 2020; Silove et al. 1998), lack of private accommodation (Porter and Haslam 2005), the resulting social isolation (Gorst-Unsworth and Goldenberg 1998), and inadequate social support networks (Laban et al. 2008; Schweitzer et al. 2006) contribute to psychological distress. Finally, loss of social status in the host country presents another significant challenge (Lindencrona et al. 2008; Carta et al. 2005). These stressors disproportionately impact specific demographic groups. Porter and Haslam (2005) observed that refugees who are older, female, more educated, or from higher pre-displacement socioeconomic backgrounds tend to experience poorer mental health outcomes. Additionally, refugees from rural areas or regions with ongoing sociopolitical conflicts exhibit heightened vulnerability to psychological challenges. Findings from these studies align with the social causation hypothesis, which identifies poor socioeconomic conditions as significant contributors to mental health challenges (Armstrong-Mensah et al. 2023; Hudson 2005).

The impact of displacement on Syrian refugees' physical and mental health is profound, with female refugees facing unique challenges (Abbott et al. 2017; Al-Krenawi 2019; Samari 2017; Şeker 2022**;** Venkatachalam et al. 2023). Syrian refugee women in Jordan and the U.S. encounter various stressors, including economic hardships, social strain, separation from family members, and difficulty accessing healthcare services (Abbott et al. 2017; Arab and Sagbakken 2018; Atrooz et al. 2023; Samari 2017; Şeker 2022; Venkatachalam et al. 2023). In Jordan, the influx of refugees has placed a substantial strain on the country's economy, leading to challenges in providing adequate health and social services to both refugees and the local population (Al-Rousan et al. 2018; Carrion 2015; Samari 2017; Marks 2024; World Bank 2017; Nabulsi et al. 2020). In contrast, refugees in the U.S. undergo a rigorous and lengthy vetting process before resettlement. Though this resettlement process provides a more stable legal framework, refugees still face challenges related to integration, social isolation, and mental health support (Kallick and Mathema 2016; Kamimura et al. 2020; Refugee Council USA 2024).

Alarmingly high prevalence rates across a range of conditions, particularly PTSD, depression, and anxiety, characterize the psychological well-being of refugees (Acarturk et al. 2018; Al-Shagran et al. 2015; Sá et al. 2022). PTSD rates vary widely, from 2.2% to 88.3% (Elhabiby et al. 2015), with extreme rates observed among torture survivors from the Middle East, Central Africa, South Asia, and Southeast Europe (Schubert and Punamäki 2011). These rates far exceed the 8% prevalence seen in the general population (Kessler et al. 1995; Weiss et al. 1992). A high prevalence of comorbid conditions is also documented. For example, a study of 278 Middle Eastern torture survivors reported 56.9% PTSD, 83.8% depression, and 81.3% anxiety (Song et al. 2015). Similar findings emerge across contexts: 40.2% depression and 31.8% anxiety among Syrian refugees in Sweden (Tinghög et al. 2017), 39.8% depression among refugees in Germany (Hoell et al. 2021), and 55.2% PTSD and depression among Turkish asylum seekers (Suhaiban et al. 2019).

Norwegian studies highlight comorbidity, with 64% of refugees experiencing both PTSD and major depression (Teodorescu et al. 2012). The variation in prevalence rates reflects a complex interplay of factors. Risk factors include female sex, older age, severity of torture, pre-migration trauma (e.g., rape/sexual assault), unstable housing, and delayed treatment access (Al-Shagran et al. 2015; Raghavan et al. 2013; Sá et al. 2022; Song et al. 2018; Chu et al. 2013). Systematic reviews corroborate these findings. Steel et al. (2009) documented that PTSD and depression rates ranged from 0% to 99%, while more recent work showed depression rates from 5.1% to 81% and anxiety from 1% to 90% (Morina et al. 2018). Studies have shown that the combination of war trauma, displacement, and resettlement challenges contributes to poor mental health outcomes among Syrian refugee women, such as depression, anxiety, and post-traumatic stress disorder (PTSD) (Rizkalla et al. 2019; Amiri et al. 2020). These outcomes vary by location, depending on factors such as access to healthcare, socioeconomic opportunities, and the degree of social integration (Akik et al. 2019; Al-Shagran et al. 2015; Sá et al. 2022; Salameh et al. 2024; Bawadi et al. 2022). Despite the growing recognition of these challenges, there remains limited research on the context-specific post-migration stress factors that predict mental health-related symptomatology and conflict-related psychological distress, particularly among Syrian refugee women.

This study aims to address this knowledge gap by examining the differential impacts of post-migration stress factors on the mental health of Syrian refugee women resettled in two distinct environments: Houston, Texas, and urban communities in northern Jordan. Specifically, the research seeks to identify how mental health status and perceived stress affect Syrian refugee women in these locations. Understanding these location-specific challenges is essential for developing targeted interventions that address the unique needs of displaced populations in different resettlement contexts (Abbott et al. 2017; Achilli 2015; Carrion 2015).

2. Materials and Methods

This is a cross-sectional study conducted in Houston and an urban setting close to the Syrian-Jordanian border in northern Jordan. The study was approved by the Institutional Review Board (IRB) Committee for the Protection of Human Subjects, University of Houston (UH), Houston, TX (approval code STUDY00002929), and by the Jordan University of Science and Technology (JUST) IRB, Irbid, Jordan (IRB#52/148/2022, 10 May 2022).

2.1. Subject Recruitment

Following study approval from the UH-IRB and JUST-IRB Committees, Syrian refugees resettled in Houston and northern Jordan were recruited. Recruitment in Jordan was conducted by JUST master's program students using convenience sampling and snowball recruitment methods. Recruitment in Houston was conducted through outreach via various community organizations. Adult Syrian refugees aged 18 years or older were included in the study; this was considered the basic criteria of inclusion.

2.2. Online Surveys

The Arabic versions of the survey questionnaires were uploaded to the UH-REDCap platform for secure survey management and data collection. The survey was accessed via REDCap link to obtain participant consent electronically. Participants were provided with the option to complete the survey questionnaire either independently or with one-on-one guidance from the research team. Upon survey completion, Houston participants received a $25 Target gift card upon survey completion and study participants in Jordan received a $7 (5 Jordanian Dinars) gift card. Several surveys were utilized; a sociodemographic questionnaire included general survey questions on demographic and socioeconomic

status such as age, education, family relationships, information on family size, health insurance, employment, and financial resources such as monthly income. Health-related questions were included in the survey. Participants were asked to state the presence of chronic diseases like diabetes, hypertension, hypothyroidism, asthma, and irritable bowel syndrome. Psychometric measures included perceived stress and mental distress evaluation utilizing Arabic versions of validated Perceived Stress Scale (PSS), Afghan Symptom Checklist (ASC), Refugee Post-Migration Stress Scale (RPMSS), and Self-Reporting Questionnaire (SRQ):

- The PSS is a global measure of perceived stress (Cohen et al. 1983). This measure consists of 14 questions that ask about one's feelings and thoughts during the past month. The questionnaire consists of seven positive items, which represent the coping ability subscale (e.g., "How often have you dealt successfully with day-to-day problems and annoyances?"), and seven negative items, which represent perceived distress (e.g., "How often do you feel nervous and stressed, or been angered because of things that happened?"). The items are rated on a 5-point scale (0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often). The total score is calculated by first reversing the scores on the seven positive items (i.e., 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0) and then summing across all 14 items (Cohen et al. 1983). The Arabic version of the PSS-14 has been previously validated (Atrooz et al. 2022; Almadi et al. 2012). The PSS-14 showed adequate reliability in our sample, with Cronbach's alpha coefficient of 0.88 for both positive and 0.88 for negative items.
- The SRQ is a questionnaire that was developed by the World Health Organization to screen for depression, anxiety, and other mental stress-related symptoms (Beusenberg and Orley 1994). SRQ comprises of 24 questions: 20 questions are related to the evaluation of neurotic symptoms, and four questions are related to the assessment of psychotic symptoms (Beusenberg and Orley 1994). In the present study, the short form of the SRQ (SRQ-20), consisting of the first 20 non-psychotic items, was utilized. This survey instrument has been previously validated in Arabic-speaking populations (El-Rufaie and Absood 1994; Al-Subaie et al. 1998). Questions in SRQ are related to certain pains and problems that may have been experienced in the last 30 days, for example, "Do you find difficulty enjoying your daily activities, or do you feel tired all the time?" Each question is scored 1 or 0: a score of 1 indicates that the symptom was present during the past month, while a score of 0 indicates that it was absent. The total score is calculated by adding the responses for all items. The total score ranges from 0 to 20 (Beusenberg and Orley 1994). In the present study, the SRQ instrument exhibited high reliability, with Cronbach's alpha value of 0.91.
- The ASC instrument seeks to identify indicators of psychological distress in situations of high conflict and post-conflict scenarios (Miller and Rasmussen 2010). Although the ASC instrument was developed in Kabul, Afghanistan, the Arabic version of this instrument showed high reliability in our previous two studies (Atrooz et al. 2022; Atrooz et al. 2023). The ASC is a 22-item instrument that inquires about the respondent's feelings and experiences in the last two-week period (e.g., "How many times you have cried, had difficulty falling asleep, or have felt hopeless?"). Response choices for each item range from "1" ("Never") to "5" ("Everyday"), with a range of total score for ASC from 20 to 100. The ASC instrument showed high reliability, with a Cronbach's alpha value of 0.95.
- The RPMSS was recently developed and validated among refugees from Syria recently resettled in Sweden (Malm et al. 2020). The survey consists of 21 items covering seven hypothesized domains of post-migration stress. Because some questions were not relevant to living in an Arab country such as Jordan, we employed 11 items of RPMS that cover the following four domains: (1) material and economic strain, (2) loss of home country, (3) family and home country concerns, and (4) family conflicts.

Each domain has at least three items. The answers are rated on a 5-point scale (1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Very Often). The scores were calculated by averaging the scores of all items in each subscale. The RPMSS showed adequate reliability in our sample, with a Cronbach's alpha coefficient of 0.84.

2.3. Statistical Analysis

We used descriptive statistics while conducting sample comparisons between Jordan-based and Houston-based Syrian refugee women using independent Chi-square tests for categorical variables. Psychometric scores comparisons between Jordan-based and Houston-based Syrian refugee women were conducted using independent sample t-test analysis. Linear regression models were used to examine the difference in the mean psychometric score between Jordan-based and Houston-based participants, education level (college or graduate studies) vs. lower education level (high school (HS) or less), health insurance status (yes vs. no), presence of chronic diseases (yes vs. no), participants' age, and participants' scores in RPMSS subscales. The overall fit of the models was statistically significant: (for PSS: adjusted $R^2 = 0.419$, $F(9, 79) = 8.053$, $p < 0.001$; for SRQ: adjusted $R^2 = 0.518$, $F(9, 88) = 12.563$, $p < 0.001$; for ASC: adjusted $R^2 = 0.476$, $F(9, 89) = 10.901$, $p < 0.001$). These results suggest that the models explain a significant portion of the variance in psychometric scores. IBM SPSS (V 29.00, Armonk, NY, USA: IBM Corp.) was used for data analyses. Statistical significance was determined at $p < 0.05$.

3. Results

3.1. Sociodemographic Characteristics of Participants

A total of 127 Syrian refugee women were included in the study (50.0% from Houston), as shown in Table 1. The participation rate was high (99.5% at both locations). The minimum age of participants was 18, and the maximum was 67, with an average age of 34.8 ± 11.2 years. Around 49.7% of participants in Jordan had a college degree, while only 29.0% of participants in Houston completed college education. Employment rates were comparable among Syrian refugee women who resettled in Jordan and those who resettled in Houston. Around 80.3% of participants in Houston were married compared to 54.0% of participants in Jordan. This may be explained by the difference in age of the participants from the two countries, as a significant number (45.2%) of Jordan-based women who participated in this study were young (18–25 years old), while 50% of Houston-based participants were in the age group of 26–39; see Table 1. Most participants in Houston had health insurance (80.4%), whereas only 10.2% of participants in Jordan did. The percentage of participants with chronic diseases was comparable in Jordan and Houston, with 28.8% of participants in Jordan and 36.5% of participants in Houston reporting having one or more chronic diseases; see Table 1.

Table 1. Sociodemographic characteristics of Jordan-based vs. Houston-based Syrian refugee women.

Variable	Jordan-Based Syrian Refugee ($n = 63$) N (%)	Houston-Based Syrian Refugee $n = 64$ N (%)	Total $n = 127$ N (%)	χ^2	p-Value
Age					
18–25	28 (45.2)	8 (12.9)	36 (29.0)	16.274	<0.001 ***
26–39	18 (29.0)	31 (50.0)	49 (39.5)		
40–59	15 (24.2)	20 (32.3)	35 (28.2)		
60+	1 (1.6)	3 (4.8)	4 (3.2)		
Education					
Less than high school	25 (39.7)	31 (50.0)	56 (44.8)	5.884	0.053
High school	7 (11.1)	13 (21.0)	20 (16.0)		

College	31 (49.2)	18 (29.0)	49 (39.2)		
Employment					
No	41 (66.1)	50 (79.4)	91 (72.8)	2.765	<0.0.72
Yes	21 (33.9)	13 (20.6)	34 (27.2)		
Relationship status					
Single	25 (39.7)	7 (11.5)	32 (25.8)	13.140	<0.004 **
Married	34 (54.0)	49 (80.3)	83 (66.9)		
Divorced/separated	3 (4.8)	3 (4.9)	6 (4.8)		
Widowed	1 (1.6)	2 (3.3)	3 (2.4)		
Health insurance					
No	55 (87.3)	11 (17.7)	66 (52.8)	60.668	<0.001 ***
Yes	8 (12.7)	51 (82.3)	59 (47.2)		
Income (poverty line: Annual income less than $9250 in Jordan and less than $25,000 in Houston)					
Below poverty line	56 (88.9)	55 (93.2)	111 (91.0%)	0.687	0.404
Above poverty line	7 (11.1)	4 (6.8)	11 (9.0)		
Chronic diseases (any) (Diabetes, hypertension, hypothyroidism, asthma, irritable bowel syndrome, cancer)					
No	45 (71.4)	38 (59.4)	83 (65.4)	2.037	0.153
Yes	18 (28.6)	26 (40.6)	44 (34.6)		
Smoking cigarettes					
Never	59 (93.7)	63 (98.4)	122 (96.1)	1.923	0.165
Current smokers	4 (6.3)	1 (1.6)	5 (3.9)		
Smoking hookah					
Never	54 (85.7)	55 (85.9)	109 (85.8)	4.262	0.119
Current smokers	9 (14.3)	9 (14.1)	18 (14.2)		

** Significant at $p < 0.01$. *** Significant at $p < 0.001$.

3.2. Psychosocial Measures

Mental distress of the Syrian refugee women was evaluated using the Perceived Stress Scale (PSS), Self-Reporting Questionnaire (SRQ), Afghan Symptoms Checklist (ASC), and Refugee Post-Migration Stress Scale (RPMS). Syrian refugee participants who resettled in Jordan exhibited significantly higher average scores (mean score = 32.34 ± 8.26) on the PSS compared to Syrian refugees who resettled in Houston (mean score = 24.38 ± 8.43; $p < 0.001$) (Table 2, Figure 1A). Jordan-based Syrian refugees exhibited significantly higher scores in SRQ (mean score = 10.27 ± 5.27), above the clinical cutoff point of 6/7, compared to refugee women who resettled in Houston (mean score = 5.15 ± 5.11; $p < 0.001$) (Table 2, Figure 1B). Similarly, Syrian refugee women who resettled in Jordan exhibited higher scores on the ASC compared to Syrian refugees who resettled in Houston (Jordan-based Syrian refugees: 54.37 ± 17.72; Houston-based Syrian refugees: 35.98 ± 15.06; $p < 0.001$) (Table 2, Figure 1C). The average total score of RPMS was comparable between Jordan-based and Houston-based Syrian refugees (Table 2). However, a comprehensive study of RPMS domains revealed that Jordan-based Syrian refugees received higher scores (mean score = 3.61 ± 1.30) in the material and economic strain domain compared to the average score of Houston-based Syrian refugees (2.86 ± 1.23; $p = 0.003$), as shown in Table 2. When compared to Syrian refugees living in Jordan, those living in Houston had significantly higher scores in the "loss of home country" and "family and home country concerns" domains (see Table 2). Additionally, Jordan-based Syrian refugees exhibited higher scores in the family conflicts domain compared to scores reported by Houston-based Syrian refugees (Table 2).

Table 2. Psychometric measure average scores of Syrian refugee women.

Measure	Jordan-Based Syrian Refugees Mean [SD]	Houston-Based Syrian Refugees Mean [SD]	t-Statistics	*p*-Value
Perceived Stress Scale (PSS)	32.34 ± 8.26	24.38 ± 8.43	5.078	<0.001 ***
Self-Reporting Questionnaire (SRQ)	10.27 ± 5.27	5.15 ± 5.11	5.470	<0.001 ***
Afghan Symptoms Checklist (ASC)	54.37 ± 17.72	35.98 ± 15.06	6.224	<0.001 ***
Refugee Post Migration Stress (RPMS) (n = 109, missing values = 18 from Houston refugee data)				
RPMS average score (1–5)	3.06 ± 0.96	3.08 ± 0.82	−0.121	0.904
1. RPMS-Subscale Material and economic strain	3.61 ± 1.30	2.86 ± 1.23	3.088	0.003 **
2. RPMS-Subscale Loss of home country	3.33 ± 1.53	4.03 ± 1.19	−2.593	0.011 *
3. RPMS-Subscale Family and home country concerns	3.27 ± 1.65	4.13 ± 1.26	−2.926	0.004 **
4. RPMS-Subscale Family conflicts	2.09 ± 1.14	1.44 ± 0.95	3.053	0.003 **

* Significant at the 0.05 level. ** Significant at the 0.01 level. *** Significant at 0.001 level.

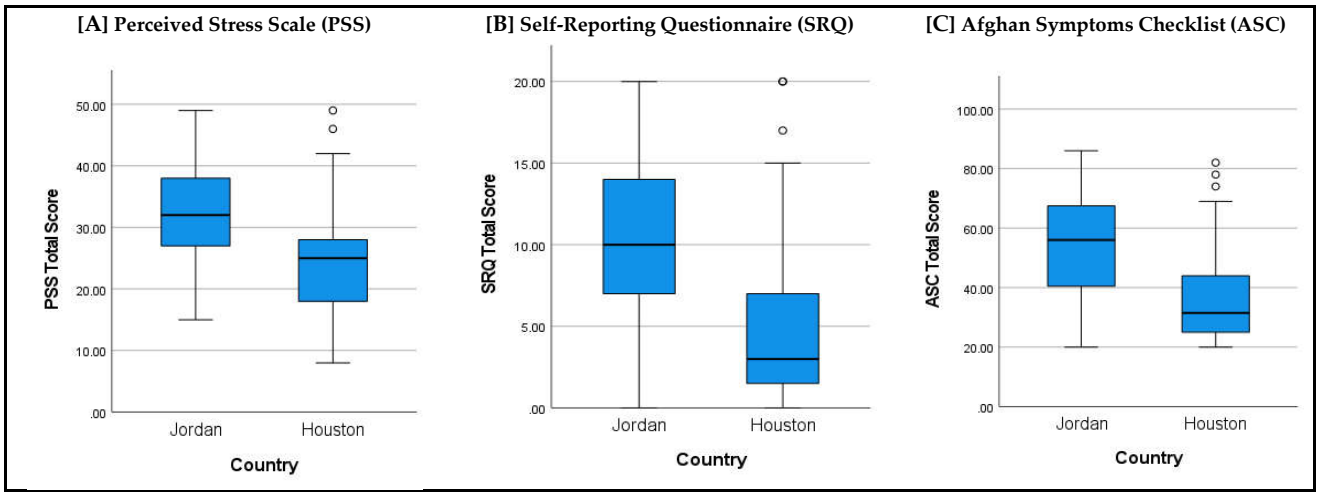

Figure 1. Psychological measure scores of Houston-based versus Jordan-based Syrian refugee women. (**A**) Perceived Stress Scale (PSS), (**B**) Self-Reporting Questionnaire (SRQ), (**C**) Afghan Symptoms Checklist. Means are represented by lines, and whiskers represent minimum and maximum values.

Predictors of Mental Distress

Regression analysis showed that the estimated difference in the mean of PSS scores between Jordan-based and Houston-based Syrian refugee women was 5.253 (p = 0.026), with higher scores exhibited by Syrian refugee women who resettled in Jordan (Table 3). Regression analysis also showed that the estimated difference in the mean SRQ scores between Jordan-based and Houston-based Syrian refugees was 3.348 (p = 0.006), again with higher scores exhibited by Syrian refugee women who resettled in Jordan (Table 3). Regression analysis also showed that the estimated difference in the mean ASC scores between Jordan-based and Houston-based Syrian refugees was 8.631 (p = 0.044), with higher scores exhibited by Syrian refugee women who resettled in Jordan (Table 3). The regression coefficient for age was found to be a significant predictor of PSS scores (β = −0.172, p = 0.026). This indicates that for each additional one year increase in participant

age, there is an average decrease of 0.172 units in the PSS score. The regression coefficient for the material and economic strain domain of the RPMS scale was found to be a significant predictor of SRQ scores (β = 1.287, $p = 0.001$), indicating that for each additional 1-unit increase in this domain score, there is an average increase of 1.256 units in the SRQ score. Similarly, the regression coefficient for the material and economic strain domain of the RPMS scale was found to be a significant predictor of ASC scores (β = 3.098, $p = 0.017$). This indicates that for each additional 1-unit increase in this domain score, there is an average increase of 3.098 units in the ASC score (Table 3).

The regression coefficient for the family conflicts domain of the RPMS scale was found to be a significant predictor of PSS scores (β = 4.002, $p < 0.001$). This indicates that for each additional 1-unit increase in this domain score, there is an average increase of 4.002 units in the PSS score. Similarly, the regression coefficient for the family conflicts domain of the RPMS scale was found to be a significant predictor of SRQ scores (β = 1.864, $p < 0.001$). This indicates that for each additional 1-unit increase in this domain score, there is an average increase of 1.864 units in the SRQ score. Additionally, the regression coefficient for the family conflicts domain of the RPMS scale was found to be a significant predictor of ASC scores (β = 6.470, $p < 0.001$). This indicates that for each additional 1-unit increase in this domain score, there is an average increase of 6.470 units in the ASC score (Table 3).

Table 3. Linear regression analysis for predictors of mental distress scores.

Variable	Perceived Stress Scale (PSS)			Self-Reporting Questionnaire (SRQ)			Afghan Symptoms Checklist (ASC)		
	(β)	*p*-Value	95.0% CI	(β)	*p*-Value	95.0% CI	(β)	*p*-Value	95.0% CI
Age	−0.172	0.026 *	19.472, 35.801	0.022	0.579	−0.056, 0.099	0.010	0.941	−0.262, 0.283
Country (Ref. Jordan)	−5.254	0.026 *	−0.323, −0.022	−3.348	0.006 **	−5.735, −0.962	−8.631	0.044 *	−17.031, −0.231
Health insurance (Ref. No)	1.297	0.567	−9.871, −0.637	−0.253	0.827	−2.545, 2.038	−5.723	0.163	−13.806, 2.361
Chronic disease (Ref. No)	2.348	0.195	−3.198, 5.791	−0.612	0.518	−2.487, 1.262	−2.689	0.417	−9.244, 3.866
Education (Ref. Did not complete HS)	−2.213	0.211	−1.224, 5.919	0.179	0.840	−1.580, 1.938	−3.437	0.271	−9.606, 2.732
RPMS- Economic strain	0.533	0.463	−5.703, 1.278	1.287	0.001 **	0.570, 2.005	3.098	0.017 *	0.574, 5.622
RPMS- Homeland loss	0.382	0.630	−0.905, 1.970	0.554	0.136	−0.178, 1.286	0.525	0.686	−2.049, 3.100
RPMS- Family concerns	−0.444	0.535	−1.192, 1.957	0.106	0.751	−0.559, 0.772	0.367	0.756	−1.975, 2.709
RPMS- Family conflicts	4.002	<0.001 ***	−1.862, 0.973	1.864	<0.001 ***	1.101, 2.628	6.470	<0.001 ***	3.776, 9.163

***. Correlation significant at $p < 0.001$ (2-tailed). **. Correlation significant at $p < 0.01$ (2-tailed). *. Correlation significant at $p < 0.05$ (2-tailed).

4. Discussion

There is paucity of studies examining gender-specific mental health issues among Syrian refugees in the U.S. or elsewhere. Only a handful of studies have examined this aspect (Alexander et al. 2021; Wu et al. 2021). In a recently published report, the prevalence of depression and anxiety were reported to be higher among women. However, no gender-specific difference was observed for possible PTSD, but a high prevalence of trauma and stress-related psychiatric disorders among Syrian refugees newly resettled in the U.S. were observed (Javanbakht et al. 2019). Considering these reports, this study was designed to examine context-specific post-migration stress factors and their varying impacts on the mental health of Syrian refugee women resettled in Houston, Texas, and urban communities in northern Jordan. Results revealed significant differences in mental health outcomes between Syrian refugees resettled in the U.S. and those in Jordan, highlighting how different post-migration environments and access to resources influence the psychological well-being of these populations.

In our sample, Syrian refugee women resettled in Jordan exhibited significantly higher levels of mental distress across various psychosocial measures than their Houston-based counterparts. One of the main contributors to this disparity is material and economic strain. It seems reasonable to hypothesize that this strain is associated with the socioeconomic challenges faced by refugees in Jordan, where limited access to lawful employment, poverty, and barriers to healthcare services exacerbate mental health problems (Nashwan and Alzouabi 2023). Historically, Jordan's economy has been significantly strained by the influx of refugees from Palestine, Iraq, and, more recently, Syria due to the onset of the Syrian civil war (Nowrasteh et al. 2020). This, combined with the country's reclassification to lower-middle-income status, has made it difficult to meet refugees' needs (World Bank 2017). Without a clear path to citizenship and with limited employment opportunities, Syrian refugees in Jordan face ongoing financial insecurity, further intensifying their stress levels (Achilli 2015; Carrion 2015; Robbin 2023). By contrast, Houston-based Syrian refugees, while still experiencing distress, reported lower levels of mental health symptomatology. This difference may be partially linked to their better access to resources such as employment, housing, and healthcare, with the support of resettlement agencies in the U.S. These agencies prioritize placing refugees in communities where they can access affordable housing and employment opportunities (Center for American Progress 2015). A higher percentage of Syrian refugees in Houston had health insurance (80.4%) compared to those in Jordan, where just 10.2% reported having health coverage. As a result, Houston-based refugees faced fewer economic barriers to healthcare and were better positioned to address their mental health concerns (Kamimura et al. 2020; Pearlman 2023). Interestingly, while Houston-based Syrian refugees reported lower levels of material and economic strain, they exhibited higher levels of distress related to loss of home and family and longing for home country. This reflects the complex emotional burden of displacement. Although Houston-based refugees may have better access to resources, their experience is characterized by a deep sense of loss regarding their home country and ongoing concerns for family members left behind in Syria (Pearlman 2023; Ghosn et al. 2021; Perez 2016). Homesickness, cultural isolation, language barriers, and feelings of disconnection from their home country were more pronounced among this group, possibly due to the geographic and emotional distance from Syria, which magnifies feelings of alienation (Bunn et al. 2023; Rosner et al. 2022). Additionally, according to Correa-Velez et al. (2020) and Hawkins et al. (2021), women struggle to rebuild social networks during displacement, leading to isolation. This isolation affects mental health, as social connections protect against psychological distress (Schweitzer et al. 2018; Vromans et al. 2020). Research shows women without trusted community connections report poorer mental health outcomes and decreased quality of life (Correa-Velez et al. 2020). This suggests that even in relatively stable post-migration environments, the emotional toll of displacement remains significant.

The regression analysis provided deeper insights into our results regarding context-specific post-migration stress factors' influence on mental health. For Syrian refugees in Jordan, higher levels of material and economic strain were significantly predictive of greater mental health distress. This suggests that economic hardship directly exacerbates mental health issues, particularly anxiety and somatization, among Jordan-based refugees (Rizkalla et al. 2021). The lack of employment opportunities and limited access to healthcare in Jordan create an environment of chronic stress that directly impacts refugees' psychological well-being (Alshoubaki and Harris 2018; Raghavan et al. 2013). The regression analysis for Houston-based refugee women shows the crucial role of family conflicts and loss of home as main causes of mental distress. These results indicate that interpersonal and emotional pressures greatly influence the mental health of Syrian refugee women in Houston. Adapting to new social norms, concerns for family left behind,

and traumatic memories of war all play a dominant role in their mental health outcomes. This impact remains strong even when material needs are less pressing. The media's portrayal of ongoing security risks in Syria further exacerbates these concerns, as refugees are constantly reminded of the dangers facing their loved ones (Douai et al. 2021).

In both contexts, the experience of conflict-related distress remains a critical factor influencing mental health. Syrian refugee women in Jordan face continuous traumatic stress, compounded by their harsh living conditions and barriers to healthcare (Boswall and Akash 2015). In Houston, refugees struggle with the emotional burden of separation from their home country and family members, even if their material circumstances are relatively stable. These findings indicate that post-migration stressors vary by location, with economic challenges having a greater impact in Jordan, while emotional and familial concerns are more prominent among refugees in the U.S. This is further supported by previous studies in which mental health and psychosocial wellbeing were reportedly influenced by various contextual factors (Yalim 2020; Miller and Rasmussen 2010; Porter and Haslam 2005).

Limitations

This article offers helpful knowledge on the mental health challenges faced by Syrian refugee women resettled in Houston and northern Jordan, but several limitations should be addressed. First, the relatively small sample size may limit the generalizability of the findings to the broader refugee population, and focusing on specific locations (Houston and Jordan) may not capture the full spectrum of experiences in other regions where Syrian refugees have relocated. Second, the cross-sectional design limits the ability to assess long-term effects or establish causality between post-migration stressors and mental health outcomes. The lack of data on migration timing, duration of stay, and legal status are variables likely to impact the findings and will be considered in future more comprehensive studies. The reliance on self-reported data presents another potential limitation, as it may introduce bias, particularly in cultures where mental health stigma could lead to underreporting. Third, the tools used in this research to conduct the survey, including the PSS and ASC, must be assessed for their cultural compatibility. These instruments may fail to include the cultural viewpoints as well as different concerns experienced by Syrian refugee women. Fourth, this analysis fails to account for the rapidly changing dynamics of the refugee situation in the Middle East. With multiple ongoing conflicts and natural disasters, including the two devastating earthquakes in 2023, the number of displaced Syrians continues to rise. While fiscal year 2024 saw a record-breaking admission of 100,034 refugees to the U.S. (including over 11,000 Syrians), future resettlement numbers remain uncertain due to changing worldwide situations. Finally, by focusing solely on female refugees, the study limits the generalizability of its findings to male refugees or other gender groups. Important factors such as coping mechanisms and access to mental health services were also underexplored, particularly given the significant differences in healthcare systems and resources between Houston and Jordan. Selection bias may have occurred as well, as individuals facing the most severe mental health issues or economic hardship may have been unable to participate in the study. Addressing these limitations in future research through larger, diverse samples and utilizing longitudinal designs would provide a more comprehensive understanding of the challenges faced by Syrian refugees across different resettlement contexts. Expanding the scope of inquiry to include culturally tailored coping mechanisms and access to mental health services would also offer critical insights for improving interventions and highlight preferences for care. Finally, it must be acknowledged that this study did not examine societal factors of discrimination and racism faced by the Syrian refugees in Jordan and Houston. Subsequent

studies will examine these aspects and offer an in-depth understanding of the psychological burden these factors elicit on refugee women.

5. Conclusions

This study emphasizes the profound influence of context-specific post-migration stress factors on the mental health of Syrian refugee women resettled in Houston, Texas, and northern Jordan. Refugees in Jordan's urban areas face significant material and economic hardships, which are closely associated with elevated levels of mental health distress. For Syrian refugees in Houston, the emotional toll of losing their homes and enduring ongoing concerns for family members left behind in Syria has a greater impact on their mental health (Bunn et al. 2023; Kamimura et al. 2020; Mallett 2004; Pearlman 2023; Perez 2016). These findings show the critical need for tailored mental health interventions that address both economic and emotional stressors within refugee populations (Achilli 2015; Al-Krenawi 2019; Akik et al. 2019; Al-Rousan et al. 2018). They also demonstrate the importance of comprehensive support systems to alleviate the psychological burden of displacement and how the migration experience may alter relationships and family dynamics.

Our work and that of others clearly suggests that it is imperative for host countries to invest in mechanisms and programs for mental health screening and for supporting mental –well-being of this vulnerable community (Armstrong-Mensah et al. 2023; Javanbakht et al. 2019). For instance, Schweitzer et al. (2018) recommend mental health screening during early resettlement, arguing that early intervention supports women's well-being and integration into their new communities (Vromans et al. 2020). It is well known that language barriers, stigma associated with seeking refuge/asylum in host countries, education level, lack of access to medical insurance, transportation, and acculturation are significant barriers to mental health-seeking attitude among Syrian refugees in the U.S. and elsewhere. Considering a high prevalence of mental illnesses related to trauma and stress among newly resettled Syrian refugees in the U.S. has been reported, installing mental health screening facilities within primary care health visits for resettled Syrian refugees would be an excellent initiative which might play an important preventive measure. Increasing translation capacity within the medical health care system by utilizing already resettled Arabic-speaking refugee medical translators will ensure accurate and culturally competent care.

Finally, destigmatizing mental health within the Syrian refugee community by engaging with key stakeholders such as Arabic-speaking religious leaders, prominent local community leaders, and previously resettled Syrian refugee communities can play a significant role in increasing awareness and engagement (Elshamy et al. 2023; Haque and Malebranche 2020). These organized efforts will help relieve stress and also improve mental health care-seeking behavior among Syrian refugees (Elshamy et al. 2023). Increasing Medicaid access in all states in the U.S. may also significantly help with long-term health coverage for mental health needs of marginalized communities. Future research should adopt a longitudinal approach to assess how mental health outcomes evolve over time in response to persistent post-migration stressors.

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