Psychological adaptation and posttraumatic stress disorder among Syrian refugees in Germany: a mixed-methods study investigating environmental factors

Anna von Haumeder, Bita Ghafoori and Jeremy Retailleau

Department of Advanced Studies in Education and Counseling, California State University Long Beach, California, CA, USA

ABSTRACT
Background: Considering the exposure to potentially traumatic events among the growing refugee population worldwide, there is an urgent need to better understand potential risk and protective factors that may be associated with psychological adaptation in Syrian refugees residing in Germany.

Objective: The present study examined trauma-related coping self-efficacy, resilience, and environmental factors as predictors of psychological adaptation and posttraumatic stress disorder (PTSD).

Method: The present study used a mixed-methods convergent parallel design examining 127 quantitative self-report questionnaires and ten qualitative semi-structured interviews.

Results: Quantitative findings showed that nearly half the sample (N = 127) met criteria for probable PTSD (n = 59, 46.5%). Logistic regression models found that lower trauma-related coping self-efficacy (CSE) was independently associated with probable PTSD in unadjusted models (OR = 0.92, 95% CI, 0.88, 0.96, p < .001) and adjusted models (OR = 0.87, 95% CI, 0.82, 0.93, p < .001). Specific environmental factors were significantly inversely related with probable PTSD. Qualitative findings indicated five main themes that were associated with psychological adaptation: 1) language, 2) socioeconomic living conditions, 3) family, 4) discrimination, and 5) asylum procedures.

Conclusion: This study suggests that higher perceived ability to deal with the consequences of having experienced potentially traumatic events as well as access to certain environmental factors were associated with better perceived psychological adaptation to German society and better mental health.

HIGHLIGHTS
- A total of 46.5% of the sample of Syrian refugees residing in Germany met criteria for probable PTSD.
- Higher trauma-related coping self-efficacy may be protective of PTSD for some Syrian refugees.
- Syrian refugees who experience high levels of post-migration living difficulties may have a high risk of PTSD.
- An environment which facilitates access to resources and fair treatment may promote processes of positive psychological adaptation among Syrian refugees.

CONTACT
Bita Ghafoori Bita.Ghafoori@csulb.edu 1250 Bellflower Blvd, Long Beach, CA 90840-2201, USA

ARTICLE HISTORY
Received 20 March 2019
Revised 12 October 2019
Accepted 18 October 2019

KEYWORDS
Refugees; trauma; PTSD; resilience; environment; mixed-methods

PALABRAS CLAVE
Refugiados; trauma; TEPT; resiliencia; ambiente; métodos mixtos

CONTACT
Bita Ghafoori Bita.Ghafoori@csulb.edu 1250 Bellflower Blvd, Long Beach, CA 90840-2201, USA

© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (http://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.
The number of people forced to flee their homes due to conflict, persecution, violence, or human rights violations has risen to a record level with 68.5 million individuals displaced worldwide (United Nations High Commissioner for Refugees [UNHCR], 2017). Syrians continue to be the world’s largest forcibly displaced population with nearly 13 million individuals having had to leave their homes by the end of 2017 (Internal Displacement Monitoring Center, 2017). Since the beginning of the Syrian conflict in 2011, approximately 1.3 million Syrians have migrated to Europe as refugees or asylum seekers (UNHCR, 2017). By 2018, about 746,000 Syrians moved to Germany, making it the largest group of refugees within Europe and the fifth-largest displaced Syrian population in the world (Statistisches Bundesamt, 2019). The immense psychological burden of forcibly displaced people worldwide is increasingly recognized as an important global health issue (Nickerson et al., 2017). Many Syrians seeking refuge have been exposed to numerous war-related stressors, such as rape, torture, witnessing death, the destruction of their homes and livelihoods, and risky and stressful flight routes (Silove, Ventevogel, & Rees, 2017). Additionally, Syrian refugees may be impacted by highly stressful post-migration living difficulties in their new host countries such as discrimination, loss of status, isolation, and harsh socioeconomic living conditions (Miller & Rasmussen, 2017). A growing body of research has demonstrated the adverse impacts of forced migration on mental health by showing higher rates of psychiatric disorders, particularly posttraumatic stress disorder (PTSD; Cengiz, Ergun, & Çakıcı, 2019; Hameed, Sadiq, & Din, 2018). At the same time, it has also been established that some individuals may show positive psychological adaptation in the face of forced migration (Sharma, Fine, Brennan, & Betancourt, 2017; Siriwardhana, Ali, Roberts, & Stewart, 2014; Ward & Kennedy, 1999). Some research has examined mental health among refugees, yet additional research on potential risk or protective factors that impact psychological adaptation is crucial for informing efforts to prevent PTSD and other negative mental health outcomes.

Social cognitive theory provides a useful conceptual framework for understanding psychological adaptation in adults who have experienced traumatic events (Benight & Harper, 2002). Embedded in this theoretical framework is the concept of coping self-efficacy (CSE), which refers to an individual’s perceived ability to cope effectively with challenges in life (Benight & Bandura, 2004). In a traumatic stress context, the concept of trauma-related CSE refers to an individual’s perception that they are able to deal with exposure to potentially traumatic events, including management of the event itself, posttraumatic living difficulties, and of distress symptoms, as well as the ability to resume one’s normal life (Benight & Bandura, 2004; Bosmans & van der Velden, 2015). The theory poses trauma-related CSE as a measure of psychological adaptation, specifically self-regulatory and goal directing capacity (Benight & Bandura, 2004). Trauma-related CSE has been shown to be a predictor of lower rates of PTSD symptoms immediately following an acute stressor (Benight & Harper, 2002) and for up to 10 years post-disaster (Bosmans, Benight, Knaap, Winkel, & Velden, 2013). No study to date has investigated the relationship between trauma CSE and PTSD among Syrian refugees in Germany.

Individuals who show high functioning and do not develop psychiatric disorders despite having faced potentially traumatic war experiences are often referred to as ‘resilient’ (Siriwardhana et al., 2014). Although there is much debate regarding the assessment of resilience, for the purpose of this study, resilience is measured as favourable personality traits...
(Wagnild & Young, 1993) and understood within the context of a broader resilience framework conceptualized by Masten’s (2014) definition of resilience as ‘the capacity of a dynamic system to adapt successfully to disturbances that threaten system function, viability, or development’ (p. 6). A social-ecological framework to understand resilience suggests various processes, including but not limited to cognitive processes and the environment/individual interaction, are associated with resilience. Resilience, conceptualized in this manner, is different than CSE since it is considered more than a perception. From a socio-ecological perspective resilience may be perceived as the capacity of an individual to develop or access psychological, social, cultural, and physical resources necessary for psychological health (Ungar, 2011). One study to date investigating resilience among Iraqi refugees residing in the United States suggested resilience was a significant inverse predictor of psychological distress but not PTSD (Arnetz, Rofa, Arnetz, Ventimiglia, & Jamil, 2013), while two other studies on refugee populations found higher resilience was associated with lower rates of PTSD (Cengiz et al., 2019; Wright et al., 2017). It remains unclear if resilience is associated with PTSD in Syrian refugees residing in Germany.

Some research suggests a facilitative environment may be as influential as individual-level variables in coping with adversity (Seccombe, 2002; Ungar, 2011). A facilitative environment is characterized and measured by the availability and accessibility of environmental factors that may mitigate post-migration stressors for refugees (Seccombe, 2002). Post-migration stressors may include prohibition to work, discrimination, adverse political climate, the loss of family and community support, cultural integration issues, harsh socioeconomic living conditions, poor language skills, loss of status, disruption of education for children, loneliness, and boredom (Laban, Gernaat, Komproe, van der Tweel, & De Jong, 2005). A non-facilitative environment has been shown to be associated with poor mental health outcomes, in particular PTSD (Aragona, Pucci, Mazzetti, & Geraci, 2012; Schweitzer, Melville, Steel, & Lacherez, 2006). An emerging body of literature suggests the more the environment facilitates access to resources that promote well-being and help to counteract post-migration stressors, the more likely individuals are to engage in processes of positive psychological adaptation (Laban et al., 2005; Ungar, 2011).

The primary aim of the current mixed-methods study was to develop a comprehensive understanding of risk and protective factors associated with psychological adaptation and PTSD among Syrian refugees residing in Germany. The current study examined three potential predictors of (mal)adaptation to exposure to potentially traumatic events: trauma-related CSE, resilience (measured as personality traits), and environmental factors. Based on previous empirical studies, we hypothesized that higher levels of trauma-related CSE would be inversely related to PTSD. We also explored whether resilience and various environmental factors would be associated with PTSD. Quantitative measures were used to gather data on the relationships between trauma-related CSE, resilience, environmental factors, and PTSD. Qualitative data was gathered to inform a more in-depth understanding of the nature of trauma experiences, mental health issues, and environmental factors that inform psychological adaptation after forced migration from Syria.

1. Methods

1.1. Study design

A mixed methods approach was employed using a convergent parallel design in which two independent strands of complementary quantitative and qualitative data were collected in the same phase and then analysed independently. All results were interpreted together in order to look for convergence, divergence, contradictions, and relationships between the two sources of data (Creswell & Clark, 2017). In using this approach, self-report questionnaires were examined (N = 127) to assess correlates associated with trauma-related CSE, resilience, and PTSD. Simultaneously, interview data (N = 10) was collected to explore trauma experiences, mental health, and environmental factors. The information gathered independently from each of the two data sets were merged after the results were analysed for an overall interpretation (Creswell & Clark, 2017).

1.2. Participants and procedure

After receiving approval from the California State University Long Beach Institutional Review Board, data was collected by the first author in two German cities. A total of 37 public organizations providing social services to refugees were contacted by the first author by email, and 14 organizations agreed to support the present investigation by allowing recruitment at their sites. Specifically, the 14 participating organizations allowed the authors to establish direct contact with potential participants or allowed the handing out of flyers and surveys at their premises. Inclusion criteria for both the quantitative and qualitative portions of the study required participants to be adult Syrian post-civil war refugees who immigrated to Germany after 2011. Potential participants were screened by the first author using a short screening questionnaire and excluded if they reported
any of the following: psychotic behaviours; self-injurious behaviours, current suicidal or homicidal ideation, or substance use in the 24 hours prior to the screening interview. Participation was strictly voluntary. Quantitative survey data and qualitative interview data were collected at the same time by the first author. A minimum of 120 survey participants was proposed to conduct the regression analyses according to Green’s rule of thumb (Green, 1991), and a minimum of ten interviews were proposed to reach saturation (Creswell & Clark, 2017). Utilizing snowball sampling for participants, a total of 130 individuals were approached, and all provided written consent to participate in the quantitative part of the study; however, surveys from three individuals had to be excluded from the analysis due to missing data. The final quantitative sample consisted of 127 adult Syrian participants. A total of ten individuals were approached to participate in the qualitative interviews and all met criteria and consented to participate in the study. The individuals who participated in the qualitative interviews chose not to complete survey questionnaires due to lack of time. Recruitment occurred from November, 2017 through February, 2018. Participants had the option of choosing to complete the questionnaires in English, German, or Arabic. All participants completed the surveys in Arabic.

1.2.1. Measures
A demographic questionnaire included questions on participants’ age, gender, city of birth, length of stay as a refugee in Germany in months, relationship status (single, married or living together, married but not living together, divorced, widowed; collapsed to single/married but not living together/divorced/widowed and married or living together due to low numbers of participants in each category), level of education (less than or equal to 8th grade, 9th to 11th grade, high school graduate, some college, 4 years of college or more), and employment (employed, a homemaker, a student, and unemployed/disabled/retired).

1.2.2. PTSD
The PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2014) is a 20-item self-report instrument to assess the DSM-5 symptoms of PTSD. Responses are rated on a five-point scale and indicate how much participants were bothered by symptoms of traumatic stress in the past month, ranging from 0 (Not at all) to 5 (Extremely). In the current sample, PCL-5 total scores showed high internal reliability (Cronbach’s α = .95; N = 127) for the sample. In addition, following Blevins, Weathers, Davis, Witte, and Domino (2015), we used a cut off score of 33 and over to define probable PTSD in our sample.

1.2.3. Trauma-related CSE
The trauma CSE scale (CSE-T; Benight, James, Waldrep, Delahanty, & Cieslak, 2015) assessed trauma-related CSE perceptions. The instrument consists of nine questions and uses a seven-point scale that ranges from 1 (I am not at all capable) to 7 (I’m totally capable). In the current sample, trauma CSE scores showed acceptable internal reliability (Cronbach’s α = .78, N = 127) for the sample. Two official Arabic-English interpreters translated the trauma CSE instrument from English into Arabic. Both translations were compared until there was agreement on a final version, which was then back-translated into English by a third official translator. As a final step, the back-translation of the instrument was shown to the original author of the instrument and signed off as appropriate by him.

1.2.4. Resilience
The Resilience Scale-11 (RS-11; Wagnild & Young, 1993) is an 11-item measure of resilience. The scale measures five core personality characteristics of resilience: perseverance, purpose, equanimity, self-reliance, and existential aloneness. Responses are ranked on a 7-point scale from 1 (No, I strongly disagree) to 7 (Yes, I strongly agree). The internal reliability of the RS-11 scores was good (Cronbach’s α = .80; N = 127) for the sample. Three official Arabic-English interpreters translated the RS-11 instrument from English into Arabic. All three translations were compared until there was agreement on a final version.

1.2.5. Environmental factors
Perceptions of the following environmental factors were assessed using an 8-item questionnaire (see Table 2 for specific questions) developed by the lead author (AvH). The questionnaire was developed based on a review of the literature (Laban et al., 2005; Seccombe, 2002). The questions had a yes or no response option. The internal reliability of the cumulative environmental questions was good (Cronbach’s α = .80; N = 127) for the Arabic version of the scale. The original English version of the instrument was translated into Arabic by three official Arabic-English interpreters and then compared until there was agreement on a final version.

1.3. Qualitative interview procedures
The lead author conducted semi-structured qualitative interviews in German (n = 7) and English (n = 1). An interpreter was used to conduct the interviews in Arabic (n = 2). Although inclusion and exclusion criteria were assessed to determine eligibility for this portion of the study, PTSD was not assessed. All participants received a 15€ H&M gift card incentive for participation. Each interview took no more than one hour and no follow-up interviews were conducted.
An interview guide informed by a convergent parallel design (Creswell & Clark, 2017) was used to explore the following areas guided by the study aims: (1) explanatory models of trauma, (2) perceived relations between trauma and current mental health, (3) adaptation challenges after leaving Syria and residing in Germany, (4) environmental issues that may be associated with adaptation after forced migration, and (5) reflections on how to best support individuals as they adapt to a new country.

### 1.4. Data analysis

Quantitative data was analysed using SPSS 24.0. All descriptive analyses, as well as cleaning of data and constructing variables, which included examination of outliers and missing data analysis, was done initially. Means, standard deviations, and percentages are presented to describe characteristics of the study sample (Table 1). A series of chi-square and t-tests examined bivariate associations between sociodemographic characteristics, environmental factors, and probable PTSD (yes/no). Binary logistic regression with odds ratios (ORs) and 95% confidence intervals (CIs) were conducted to examine relationships between independent variables (i.e., trauma-related CSE, resilience) and probable PTSD. Bonferroni corrections were applied as appropriate considering that multiple comparisons across variables may lead to spurious significance (Perneger, 1998).

Independent variables and covariates were entered simultaneously, thus ORs for each variable adjust for the relative contribution of the other variables in the model. Analyses were conducted for the PCL-5 as both a continuous and as a dichotomous variable, and since the relative contribution of the other variables in the model. Analyses were conducted for the PCL-5 as both a continuous and as a dichotomous variable, and since the results were similar, only results relating to ‘probable PTSD’ were reported to improve interpretability.

Qualitative data was gathered from transcripts based on digital recordings of completed semi-structured interviews. Using a methodology of ‘Coding Consensus, Co-occurrence, and Comparison’ outlined by Willms et al. (1992) and rooted in grounded theory (i.e., theory derived from data and then illustrated by characteristic examples of data; Glaser & Strauss, 1967), interview transcripts were analysed utilizing an inductive approach to the analysis. The lead author and third author took an iterative approach to examining the narrative data independently. Each reviewed the transcripts independently for initial patterns and the development of codes. Analytical memos were written to describe definitions of codes and decisions during the analytic process, highlighting sample text segments for each code. Axial coding was completed to identify associations between emergent themes. Further, by constantly comparing the thematic categories with one another, repeated categories were condensed into broad themes as applicable. After development of all initial codes and themes, the two coders then met weekly to debrief and discuss the coded data to corroborate or modify themes. The finalized codebook was developed from this iterative process that then served as the basis for conducting a line-by-line analysis of the interviews. Members of the research team recoded all of the interviews using the final codebook to establish consensus reliability.

After the themes were developed and revised, results from quantitative and qualitative sources were interpreted, analysed, and merged to mutually inform and enrich overall findings (Creswell & Clark, 2017). Parallels and contradictions found between quantitative and qualitative results were interpreted and discussed to generate a fuller understanding of psychological adaptation among trauma-exposed Syrian refugees residing in Germany.

### Table 1. Association between demographic characteristics and PTSD (N = 127)

| Characteristics                          | Whole Sample  | No PTSD (n = 68) | PTSD (n = 59) | Difference between Groups | p   |
|------------------------------------------|---------------|------------------|---------------|---------------------------|-----|
| Age (M(SD))                              |               |                  |               |                           |     |
| 18-67 years age range                    | 31.9(10.68)   | 32.21(10.70)     | 31.64(10.76)  | t(119)=0.29               | .935|
| Months in Germany (M(SD))                | 23.7(10.39)   | 24.52(7.37)      | 22.74(13.08)  | t(124)=0.96               | .000|
| Gender n(%)                              |               |                  |               |                           |     |
| Female                                   | 43(33.9)      | 25(58.1)         | 18(41.9)      | χ²(1)=0.55                | .457|
| Male                                     | 84(66.1)      | 23(41.8)         | 26(58.2)      |                           |     |
| Relationship Status n(%)                 |               |                  |               |                           |     |
| Single / Married but not living together / divorced/widowed | 72(56.7)      | 33(45.8)         | 39(54.2)      | χ²(1)=3.97                | .046|
| Married or living together                | 55(43.3)      | 35(63.6)         | 20(36.4)      |                           |     |
| Education n(%)                           |               |                  |               |                           |     |
| ≤ 8th gr.                                | 20(15.7)      | 8(40.0)          | 12(60.0)      | χ²(4)=9.31                | .054|
| 9th to 11th grade                        | 22(17.3)      | 8(36.4)          | 14(63.6)      |                           |     |
| High school graduate                     | 19(15.0)      | 10(52.6)         | 9(47.4)       |                           |     |
| Some college                             | 28(22.0)      | 21(75.0)         | 7(25.0)       |                           |     |
| 4 years of college or more               | 38(29.9)      | 21(55.3)         | 17(44.7)      |                           |     |
| Employment n(%)                          |               |                  |               |                           |     |
| Employed                                 | 20(15.7)      | 11(35.0)         | 9(45.0)       | χ²(3)=5.78                | .123|
| Homemaker                                | 21(16.5)      | 16(76.2)         | 5(23.8)       |                           |     |
| Student                                  | 42(33.1)      | 20(47.6)         | 22(52.4)      |                           |     |
| Unemployed / disabled/retired            | 43(33.9)      | 20(46.5)         | 23(53.5)      |                           |     |
2. Results

2.1. Demographic characteristics

Sample characteristics (N = 127) are summarized in Table 1. The mean age of adults in the sample was 31.9 years (SD = 10.68) and the sample reported a mean number of 23.7 months in Germany (SD = 10.39). The sample was predominately male (66.1%), single/married but not living together/divorced/widowed (56.7%), educated with 4 years of college of more (29.9%), and students (33.1%) or unemployed/disabled/retired (33.9%).

2.2. Relationships between demographic characteristics and probable PTSD

Table 1 compares those individuals who screened positive for probable PTSD and those who did not on demographic characteristics. A total of 46.5% (n = 59) of the sample screened positive for PTSD based on the PCL-5, and the average PTSD severity score for the sample was 34.51 (SD = 18.93). Significant differences between the PTSD positive and no PTSD groups were found in relationship status (X^2(1) = 3.97, p < .05) and education (X^2(4) = 9.31, p < .05).

2.3. Relationships between environmental factors and probable PTSD

A majority of the sample reported ‘yes’ to the environmental factors assessed (see Table 2). Significant differences between the PTSD positive and no PTSD groups were found with respect to the following factors, with no probable PTSD significantly reporting ‘yes’ more often to: treated fairly in the community (70.5%); content with current housing situation (73.5%); have enough food to eat (65.0%); have enough money to function well on a daily basis (69.8%); have access to a doctor/hospital (60.7%); have access to education, skills training, and/or employment programmes (70.5%).

2.4. Relationships between trauma CSE, resilience, and probable PTSD

Table 3 shows Pearson product-moment correlation analyses conducted to examine the relationship between current PTSD symptoms, trauma-related CSE, and resilience. For the sample as a whole, lower levels of current PTSD symptoms were significantly related to higher trauma-related CSE scores (r = -0.54, p < .001) and higher resilience scores (r = -0.25, p < .01). Trauma-related CSE and resilience were also significantly correlated (r = 0.48, p < .001).

The sample had a mean trauma-related CSE score of 44.83 (SD = 10.16) and a mean resilience score of 58.65 (SD = 11.70; see Table 4). Logistic regression models found that lower trauma-related CSE was independently associated with probable PTSD in unadjusted models (Table 4; OR = 0.92, 95% CI, 0.88, 0.96, p < .001). After adjusting for significant demographic characteristics, those individuals with lower trauma-related CSE had a greater odds ratio of probable PTSD (OR = 0.87, 95% CI, 0.82, 0.93, p < .001). Resilience was not found to be independently associated with PTSD in adjusted or unadjusted models.

2.5. Qualitative findings

Participant responses to questions on trauma, mental health, and psychological adaptation challenges in Germany clustered around five interrelated themes that contributed to the understanding of factors associated with these issues: 1) language, 2) socioeconomic living conditions, 3) family, 4) discrimination, and 5) asylum procedures.

2.5.1. Theme 1: language

All participants emphasized a lack of language skills as one of their main challenges to psychological

---

### Table 2. Association between environmental factors and PTSD (N = 127)

| Environmental Factors | Whole Sample (N = 127) | No PTSD (n = 68) | PTSD (n = 59) | Difference between Groups | p |
|-----------------------|-----------------------|-----------------|--------------|--------------------------|---|
| I know where to get help in the community n(%) | 107(84.3) | 55(71.4) | 52(86.6) | X^2(1) = 1.04 | .307 |
| I feel safe in my community n(%) | 105(82.7) | 57(55.3) | 48(81.4) | X^2(1) = 0.58 | .446 |
| I am treated fairly in my new community n(%) | 78(61.4) | 55(70.5) | 23(38.9) | X^2(1) = 2.43 | .120 |
| I am content with my current housing situation n(%) | 83(65.4) | 61(73.5) | 22(36.4) | X^2(1) = 3.84 | .050 |
| I have enough food to eat n(%) | 103(81.1) | 67(65.0) | 36(60.0) | X^2(1) = 2.91 | .090 |
| I have enough money to function well on a daily basis n(%) | 86(67.7) | 60(69.8) | 26(44.1) | X^2(1) = 14.18 | .000 |
| I have access to a doctor/hospital n(%) | 107(84.3) | 65(60.7) | 42(71.2) | X^2(1) = 32.95 | .000 |
| I have access to education, skills training, and/or employment programs n(%) | 88(69.3) | 62(70.5) | 26(44.1) | X^2(1) = 14.18 | .000 |

---

### Table 3. Correlations between Trauma Coping Self-Efficacy, Resilience, and PTSD (N = 127)

| | PCL-5 | CSE-T | RS-11 |
|---|---|---|---|
| PCL-5 | - | -0.54*** | -0.25** |
| CSE-T | - | 0.48*** | |
| RS-11 | - | - | |

*PTSD Checklist for DSM-5 (PCL-5)
Trauma Coping Self-Efficacy (CSE-T)
Resilience Scale-11
***p < .001; **p < .01; *p < .05.
adaptation. By being able to verbally explain one’s struggles to medical professionals as well as to other local community members, language was described as a crucial tool to better understand and cope with trauma-related psychological and physical symptoms and overcome social isolation. Participants stated language allowed them with challenging stereotypes and discrimination attached to the refugee status, which they perceived contributed to social isolation and other mental health symptoms. An increase of social-inclusion was linked to better language skills. Participants pointed out a lack of language skills as the key impediment in meeting their basic needs in the form of housing, income, finding employment, and understanding their asylum procedure due to the current dearth of Arabic speaking interpreters in public German institutions. One male participant who came to Germany approximately two years ago stated,

“The most difficult challenge was the communication. I always say that the language is the key for everything. Because if there is communication, you can talk to other people and express your opinions easily. If a German sees me and I don’t speak a single word of German, he or she might think, who is this person? What does he think? What is in his head? Is he dangerous? This scares other people. But if I am able to talk to them and share my thoughts with them like an open book, they know he is a good man. He has a goal; he wants to work. And that gives me a good feeling.”

2.5.2. Theme 2: socioeconomic living conditions

Most of the participants were either unemployed or worked below the level of training and education they completed in Syria due to bureaucratic and structural barriers. Accordingly, many participants described financial problems and struggling with financial obligations towards family members in Syria. The inability to access employment or having to work below their previous level of training was linked to lower self-esteem, frustration, and a sense of despair. Further challenging socioeconomic conditions included housing problems and perceived lack of medical and welfare support. Participants also emphasized that their new socioeconomic living situation represented a loss of social status. The inability to provide for their families as well as the general decline in social status was perceived to impact important Syrian values, such as hospitality (diyaafah), generosity (karam), respect (ihti-raam), dignity (karameh), honour (sharaf), saving face and avoiding public shame (ayybb), and providing for family. These issues were discussed in relation to increased anxiety, hopelessness, and sadness. One male participant stated,

“So far, the most difficult thing has been finding a secure job. Really I thought a lot about this question. They need papers, no practical experience. The worst thing is that I worked for 23 years in the IT field but that doesn’t matter. Only certificates matter and they need to be recognized. But why don’t you just give me a chance? I worked for a big company in the IT department, and I got an excellent certificate, but they said, they want to have a real certificate.”

2.5.3. Theme 3: family

A key source of concern and anxiety for many participants was having to leave family members behind and being worried about their wellbeing, safety, and reunification. On the same note, all participants described family as their main motivation to persist when being faced with barriers and as a main source of support when dealing with the consequences of traumatic experiences (e.g. anxiety, social withdrawal, depressive moods). For the interviewees who were parents, a better future for their children, free from exposure to war and displacement, were the main reason for leaving Syria and their biggest source of motivation for their lives in Germany. One male participant who came to Germany three years ago stated:

“In the beginning here in Germany everything was pretty horrible. I was a bit pessimistic, ... I was always worried about my family in Syria, maybe they die today or tomorrow or something happens to them. I was completely desperate ... So I had to really understand that back in Syria, if I needed money, there was my family, my father, brother, relatives, there was also my grandma. When I was in trouble, I always knew that there were people behind me, no matter what I do, I knew there are people who support me. Here I had to learn that I am completely on my own.”

2.5.4. Theme 4: discrimination

Participants expressed their frustration of being confronted with stereotypes and discrimination, which
they perceived as a type of trauma and a threat to their ability to adapt to life in Germany. Also, it was pointed out by several Muslim participants that they felt discriminated against because of their religion. When asked about what gives participants hope and strength to continue their journey in Germany, interviewees replied that religion was a source of strength. Even though religion was described as a source of discrimination, it also seemed to be an important factor in making meaning of traumatic events experienced and overall hardship.

One female participant expressed this struggle with cultural differences:

“I am a believer and I always say that God, so Allah, gave us many, many things even though we lost a lot. Our faith helps us a lot to concentrate on what I have right now … and not what I have lost and how I am currently being poorly treated by some Germans because they do not like Muslims. I am of the opinion that the war is not a punishment of God but a test. And if Allah asks what did you do in this test, I will be able to say that I used my life to help others [pause] Even though I fled myself, I helped other refugees. I was also active in a new country and new society and presented a positive picture of our religion and culture.”

2.5.5. Theme 5: asylum procedures

Another source of distress among the interview participants was the uncertainty about their citizenship status and thus their future. Many interviewees expressed worries that Syria might be declared a ‘safe country’ and that they might be forced to return to a still unsafe environment, which they associated with potentially traumatic events they experienced. Participants described an uncertain and/or temporary immigration status as a constant source of fear and hopelessness.

One male participant stated:

“There is only one thing that we need. We need to know if we can stay here or not. We didn’t want to leave Syria. We thought we go back to Syria as soon as the war finishes. But now after almost seven years, we cannot go back because there is still the same government in Syria. I mean Bashar Al Assad stays and he is the president of the same army, that’s why we cannot go back … it would mean certain death.”

3. Discussion

The current study used mixed methods to examine psychological adaptation and PTSD among Syrian refugees residing in Germany. It was found that 46.5% of the sample screened positive for probable PTSD. This finding is consistent with the broad literature on PTSD among refugees that suggests PTSD prevalence ranges from 4% to 86% (Kury, Dussich, & Wertz, 2018). Consistent with our hypothesis, trauma-related CSE was inversely related to probable PTSD. Resilience was not found to be inversely related to probable PTSD. The absence of several environmental factors were associated with probable PTSD. The quantitative results specific to environmental factors were consistent with themes that emerged from the qualitative interviews. Both qualitative and quantitative results found that access to specific environmental factors were associated with better perceived psychological adaptation. Qualitative results suggested that participants who described positive psychological adaptation identified the following factors to be important: German language skills; access to education and/or employment; and connectedness to/support from family. Participants also described perceived discrimination and uncertain asylum procedures as sources of continued anxiety and barriers to positive psychological adaptation. The combination of qualitative and quantitative findings may add to the understanding of important factors related to psychological adaptation of Syrian refugees.

Some of our findings are consistent with literature on trauma-related CSE from a social cognitive theory framework (Benight & Bandura, 2004). For example, consistent with past research on CSE in a traumatic stress context, our results found that individuals lower in trauma CSE had a greater likelihood to have probable PTSD (Benight & Harper, 2002; Bosmans et al., 2013). This suggests that individuals with higher trauma-related CSE may be able to adapt to the consequences of traumatic events without exhibiting distress associated with PTSD. Perhaps higher trauma-related CSE may allow for control over specific traumatic memories and trauma emotions, which may facilitate recovery (Benight & Harper, 2002). Additional research is necessary to further understand the mechanisms by which trauma-related CSE may influence PTSD.

The present study did not show any association between probable PTSD and resilience. The literature focused on the association between PTSD and resilience in refugee populations is sparse and mixed with no studies to date investigating Syrian refugees residing in Germany. A possible explanation for the lack of association between PTSD and resilience could be that the resilience scale utilized measured ‘a positive personality characteristic’ (Wagnild & Young, 1993). Perhaps, consistent with past research in other trauma-exposed populations, the measure used did not account for other crucial factors that may be associated with resilience, including the perceived ability to adapt to traumatic experiences by locating and accessing environmental resources (Ungar, 2011). Future research may investigate environmental factors as possible mediators in the relationship between resilience and PTSD in Syrian refugees.

Findings from the current study suggested that the absence of certain environmental factors were associated with probable PTSD, such as the perception of being treated fairly in the community, the availability and accessibility of resources that meet participants’
needs for housing, food, enough money to function on a daily basis, medical care, and education or employment. These findings are in accordance with earlier studies that found that refugees who experienced high levels of post-migration living difficulties and social rejection were more likely to develop PTSD than individuals without such difficulties (Aragona et al., 2012). Our results are consistent with one other study investigated the relationship between post-migration stressful experiences and mental health among Syrian refugees residing in Sweden (Tinghög et al., 2017). According to this study, being separated from family, feeling socially isolated and excluded, and struggling with poverty seem to be the most common factors that negatively impact the psychological well-being of Syrians resettled in Sweden. The qualitative results from our study support the quantitative findings such that access to basic needs, education, and employment were highlighted as factors that participants considered important to positive psychological adaptation. In addition, speaking the language of the host country, which was perceived as crucial in accessing education and work opportunities, was emphasized as important in relation to psychological adaptation. The combination of our quantitative and qualitative findings supports previous research that suggest that an environment, which facilitates access to resources and fair treatment, may mitigate the impact of adversity and can promote processes of positive psychological adaptation to German society (Laban et al., 2005; Ungar, 2011). However, the relationship between Syrian refugee trauma, psychological adaptation, and psychological functioning is complex, and future research is necessary to further understand the role of the environment in refugee mental health.

Despite this study’s contribution to the literature on factors associated with psychological adaptation among Syrian refugees, it has several limitations. The sample was not randomly selected and may not be generalizable to the larger population of Syrian refugees. The scale assessing environmental factors was developed by the lead researcher, and it has undetermined psychometric properties. The scale assessing resilience measured ‘resilient personality traits’ and thus may not capture the broader construct of resilience. The study did not account for past trauma history of participants, which may be a confounding variable, and future research should include an assessment of past trauma history. Other limitations include use of self-report measures instead of a standardized clinical interview to assess for PTSD. Even though standard back-translation procedures from the English to the Arabic language were conducted, their psychometric performance in the present investigation was not tested. Approximately 80% of the qualitative interviews were not conducted in the native language of the interviewees, which may have impacted the participants’ ability to fully convey their experience. The qualitative findings have limited inference as they present the unique experience of those who agreed to participate in the interviews. There was no overlap between participants in the quantitative and qualitative parts of the study.

Despite the limitations, the current study findings allow for insight into potential priorities that should be considered to enhance psychological adaptation of Syrian refugees residing in Germany. Findings suggest that higher trauma-related CSE as well as perceived access to basic needs (food, shelter, access to employment) may be protective of PTSD for some refugees. Perhaps case management may increase access to basic needs that may reduce anxiety and distress and improve mental health. Culturally relevant evidence-based trauma treatment may be helpful to process symptoms associated with PTSD and increase trauma-related CSE. Language barriers may prevent refugees from seeking and receiving care, and providers may consider working with social service agencies that serve refugees with interpreters as a means to bridge this gap. Additional research is needed to explore trauma-related CSE in relation to PTSD and mechanisms by which trauma-related CSE may impact PTSD, in particular among refugees residing in a foreign country of residence. Further research is also needed on culturally specific understandings of what constitutes positive psychological adaptation and effective trauma treatment following adversity, as well as what type of resources and environmental conditions are viewed as facilitative.

Disclosure statement
No potential conflict of interest was reported by the authors.

ORCID
Bita Ghafoori http://orcid.org/0000-0001-9516-4267

References
Aragona, M., Pucci, D., Mazzetti, M., & Geraci, S. (2012). Post-migration living difficulties as a significant risk factor for PTSD in immigrants: A primary care study. *Italian Journal of Public Health*, 9(3), 1–8.
Arnetz, J., Rofa, Y., Arnetz, B., Ventimiglia, M., & Jamil, H. (2013). Resilience as a protective factor against the development of psychopathology among refugees. *The Journal of Nervous and Mental Disease*, 201(3), 167–172.
Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy*, 42(10), 1129–1148.
Benight, C. C., & Harper, M. L. (2002). Coping self-efficacy perceptions as a mediator between acute stress response
and long-term distress following natural disasters. *Journal of Traumatic Stress*, 15(3), 177–186.

Benight, C. C. K., James, L. E., Waldrep, E. E., Delahanty, D. L., & Cieslak, R. (2015). Trauma CSE: A context-specific self-efficacy measure for traumatic stress. *Psychological Trauma: Theory, Research, Practice, and Policy*, 7(6), 591–599.

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489–498.

Bosmans, M. W., Benight, C. C., Knaap, L. M., Winkel, F. W., & Velden, P. G. (2013). The associations between coping self-efficacy and posttraumatic stress symptoms 10 years postdisaster: Differences between men and women. *Journal of Traumatic Stress*, 26(2), 184–191.

Bosmans, M. W. G., & van der Velden, P. G. (2015). Longitudinal interplay between posttraumatic stress symptoms and coping self-efficacy: A four-wave prospective study. *Social Science & Medicine*, 134, 23–29.

Cengiz, I., Ergün, D., & Çakıcı, E. (2019). Posttraumatic stress disorder, posttraumatic growth and psychological resilience in Syrian refugees: Hatay, Turkey. *Anatolian Journal of Psychiatry*, 20(3), 269–276.

Creswell, J. W., & Clark, V. L. P. (2017). Designing and conducting mixed methods research. Los Angeles, CA: Sage.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine Publishing Company.

Green, S. B. (1991). How many subjects does it take to do a regression analysis. *Multivariate Behavioral Research*, 26(3), 499–510.

Hameed, S., Sadiq, A., & Din, A. U. (2018). The increased vulnerability of refugee population to mental health disorders. *Kansa Journal of Medicine*, 11(1), 1–12.

Internal Displacement Monitoring Center. (2017). Syria: Country information. Retrieved from http://www.internal-displacement.org/countries/syria

Kury, H., Dussich, J. P., & Wertz, M. (2018). Migration in Germany: An international comparison on the psycho-traumatic stress among refugees. In Kury, H., & Redo, S. (Eds.), *Refugees and migrants in law and policy* (pp. 313–354). Cham, Switzerland: Springer.

Laban, C. J., Gernaat, H. B., Komproe, I. H., van der Tweel, I., & De Jong, J. T. (2005). Postmigration living problems and common psychiatric disorders in Iraqi asylum seekers in the Netherlands. *The Journal of Nervous and Mental Disease*, 193(12), 825–832.

Masten, A. S. (2014). Global perspectives on resilience in children and youth. *Child Development*, 85(1), 6–20.

Miller, K. E., & Rasmussen, A. (2017). The mental health of civilians displaced by armed conflict: An ecological model of refugee distress. *Epidemiology and Psychiatric Sciences*, 26(2), 129–138.

Nickerson, A., Liddell, B., Asnaani, A., Carlsson, J., Fazel, M., Knaevelstrud, C., … Rasmussen, A. (2017). Trauma and mental health in forcibly displaced populations: An international society for traumatic stress studies briefing paper. Retrieved from http://www.issts.org/getattachment/Education-Research/Briefing-Papers/Trauma-and-Mental-Health-in-Forcibly-Displaced-Pop/Displaced-Populations-Briefing-Paper_Final.pdf.aspx

Perneger, T. (1998). What’s wrong with Bonferroni adjustments? *British Medical Journal*, 316, 1236–1238.

Schweitzer, R., Melville, F., Steel, Z., & Lacherez, P. (2006). Trauma, post-migration living difficulties, and social support as predictors of psychological adjustment in resettled Sudanese refugees. *Australian and New Zealand Journal of Psychiatry*, 40(2), 179–188.

Seccombe, K. (2002). “Beating the odds” versus “changing the odds”: Poverty, resilience, and family policy. *Journal of Marriage and Family*, 64(2), 384–394.

Sharma, M., Fine, S. L., Brennan, R. T., & Betancourt, T. S. (2017). Coping and mental health outcomes among Sierra Leonean war-affected youth: Results from a longitudinal study. *Development and Psychopathology*, 29(1), 11–23. https://doi-org.cslub.idm.oclc.org/10.1017/S0954579416001073

Silove, D., Ventevogel, P., & Rees, S. (2017). The contemporary refugee crisis: An overview of mental health challenges. *World Psychiatry*, 16(2), 130–139.

Srirwardhana, C., Ali, S. S., Roberts, B., & Stewart, R. (2014). A systematic review of resilience and mental health outcomes of conflict-driven adult forced migrants. *Conflict and Health*, 8(1), 1–14.

Statistisches Bundesamt. (2019). *Bevölkerung und Erwerbstätigkeit. Ausländische Bevölkerung Ergebnisse des Ausländerzentralregisters*. 2018 [PDF document]. Retrieved from https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Migration-Integration/Publikationen/Downloads-Migration/auslaend-bevoelkerung-2010200187004.pdf?__blob=publicationFile

Tingbog, P., Malm, A., Arwidson, C., Sigvardsson, E., Lundin, A., & Saboonchi, F. (2017). Prevalence of mental ill health, traumas and postmigration stress among refugees from Syria resettled in Sweden after 2011: A population-based survey. *BMJ Open*, 7(12), Article ID e018899.

Ungar, M. (2011). The social ecology of resilience: Addressing contextual and cultural ambiguity of a nascent construct. *American Journal of Orthopsychiatry*, 81(1), 1–17.

United Nations High Commissioner for Refugees. (2017). *Global trends - Forced displacement in 2017* [PDF document]. Retrieved from http://www.unhcr.org/5b27be547.pdf

Wagnild, G. M., & Young, H. M. (1993). Development and psychometric evaluation of the resilience scale. *Journal of Nursing Measurement*, 1, 165–178.

Ward, C., & Kennedy, A. (1999). The measurement of sociocultural adaptation. *International Journal of Intercultural Relations*, 23(4), 659–677.

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2014). *The PTSD checklist for DSM-5 (PCL-5)*. Retrieved from the National Center for PTSD; website: https://www ptsd.va.gov/

Willms, D. G., Best, A. J., Taylor, D. W., Gilbert, J. R., Wilson, D. M. C., Lindsay, E. A., & Singer, J. (1992). A systematic approach for using qualitative methods in primary prevention research. *Medical Anthropology Quarterly*, 4(4), 391–409.

Wright, A. M., Talia, Y. R., Aldhalimi, A., Broadbridge, C. L., Jamil, H., Lumley, M. A., … Arnett, J. E. (2017). Kidnapping and mental health in Iraqi refugees: The role of resilience. *Journal of Immigrant and Minority Health*, 19(1), 98–107.