



Traumatic exposure, acculturative stress and cultural orientation: the influence on PTSD, depressive and anxiety symptoms among refugees

Dzenana Kartal^{1,2} · Nathan Alkemade² · Maurice Eisenbruch¹ · David Kissane¹

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Abstract

Objective Acculturation studies conducted with refugees have predominantly concentrated on investigating the impact of acculturative stress on mental health, and have neglected to investigate the impact of cultural orientations towards the host and ethnic cultures. Furthermore, exposure to traumas is highly prevalent in refugees and strongly associated with mental health outcomes, however, rarely included in investigations of acculturative process of refugees.

Method Using structural equation modelling, this study tested an integrated model of the relationship between traumatic exposure, acculturative stress, host and ethnic cultural orientations and posttraumatic stress disorder (PTSD), depression and anxiety symptoms among 138 Bosnian refugees resettled in Australia and Austria.

Results The model showed an overall good fit and noteworthy amount of variance indicating that traumatic exposure is the strongest direct and indirect predictor of PTSD, depression and anxiety symptoms. Furthermore, acculturative stress was identified as a significant risk factor influencing host cultural orientation, mediating the effect of traumatic exposure on all mental health outcomes.

Conclusion Acculturative stress and cultural and social stressors that are related to acculturation need to be addressed alongside provision of effective psychotherapy, especially since they are significant impediments to host cultural orientation and constructive engagement with mental health services in refugees.

Keywords Trauma · Acculturation · Refugees · Mental health · PTSD

Introduction

The impact of multiple and chronic exposures to conflict- and persecution-related traumas along with their adverse psychological effects on refugees and displaced persons are now widely documented in the literature [1, 2]. Recently, there is a growing interest in the literature surrounding the relationship between acculturation and the mental health of refugees. While it is widely acknowledged that conflict- and persecution-related traumatic experiences may lead to

mental health problems such as posttraumatic stress disorder (PTSD) and depression [2, 3], migration and the acculturative process can also be extremely stressful which can furthermore compromise the already vulnerable mental health of refugees [1]. Acculturation studies on refugee mental health have predominantly concentrated on investigating the impact of acculturative stress on the mental health of refugees, identifying it as a significant risk factor for mental health problems [e.g. 4–6]. Studies investigating how acculturative orientation towards host and ethnic cultures impacts mental health are few in comparison, and those have predominantly concentrated on specific refugee groups resettled in the US [e.g. 7–9]. However, lacking from most of these studies is an investigation into the simultaneous relationships between pre-migratory traumatic exposure and acculturative processes with mental health outcomes.

This study seeks to fill this gap by investigating the relationships between pre-migratory traumatic exposure, acculturative stress and cultural orientation with mental

✉ Dzenana Kartal
dkartal@unimelb.edu.au

¹ School of Clinical Sciences, Department of Psychiatry, Monash University, Clayton, Australia

² Phoenix Australia - Centre for Posttraumatic Mental Health, Department of Psychiatry, University of Melbourne, Carlton, Australia

health. Specifically, it examines the effects of exposure to war-related traumatic experiences, acculturative stress, and ethnic- and host-cultural orientations on the symptoms of PTSD, depression and anxiety.

Pre- and post-migratory stressors and mental health of refugees

Refugees are exposed to a myriad of pre-migratory traumatic events that are based on deliberate and targeted persecution against their ethnic, cultural, religious or political beliefs and values. Notwithstanding the individual variation of such experiences, the research evidence suggests that refugees are generally exposed to multiple, sometimes extreme traumas such as torture, rape and death of family members [10], which places refugees at higher risk of developing serious mental health problems [2]. Compared to the general population, refugees can be 5–10 times more likely to present with depression and PTSD symptoms [11], especially if exposed to interpersonal and multiple traumas [2].

The pre-migratory traumatic experiences associated with war and conflicts are compounded when refugees seek resettlement elsewhere. There are specific stressors and challenges associated with migration to a new country, including poverty, unstable working conditions and unemployment, social exclusion and discrimination, host language difficulties and other similar stressors [12–15].

Post-migratory challenges are often related to *acculturation*, defined as the process of simultaneous participation with the new culture and maintenance of the ethnic culture and identity [16]. Acculturation is seen as the result of *stress* and *conflict* arising out of contact and participation between the two cultures. Acculturative stress related to the demands and difficulties associated with and arising out of the acculturative process is highlighted as the underlying mechanism of this process [16, 17]. The degree of acculturative stress itself influences the ethnic-cultural orientation (i.e. the cultural maintenance and orientation towards the ethnic culture) and host-cultural orientation (i.e. learning and adoption of the host culture) [18]. The consequences of the acculturation process are substantial and seem to influence psychological and sociocultural outcomes in migratory groups and individuals [19].

Despite the widely held presumption that immigrants should have worse mental health due to stress associated with the acculturative process, research evidence often demonstrates that minorities have better mental health than the population of the dominant cultures. This phenomenon is commonly identified as the “immigrant paradox” [for discussion see: 20, 21]. Still, the evidence underlying the effect of the ethnic and host cultural orientation on mental health is mixed. Systematic reviews and meta-analyses conducted with migrants showed that orientation

towards the host culture, at the expense of the ethnic culture maintenance, had no relationship with depression [22] or reduced the risk of depression [23]. Similarly, orientation towards the ethnic culture alone demonstrated no relationship with depression [23]. However, high identification with both cultures related to better psychological and socio-cultural adaptation and this relationship seemed stronger than when there was a preference for one culture only (ethnic or host) [24].

Evidence of the effects of cultural orientation on mental health in refugee populations is very sparse and yields mixed results [25]. Some studies demonstrated a protective value of ethnic cultural orientation against psychological distress [4], but not anxiety [26]. Others identify host cultural orientation to be associated with higher levels of psychological distress [27] and to be unrelated to anxiety [26]. Host cultural orientation was also found to contribute to better life satisfaction and reduced psychological distress when mediated by occupational success, while ethnic cultural orientation had the same effect and was mediated by ethnic social support [8]. Cultural competence in both ethnic and host cultures was associated with fewer depressive symptoms in one study [28], but not another [26]. Weaker social integration with the host culture was also associated with higher levels of PTSD and depressive symptoms, while weaker integration into the ethnic community was associated with complex PTSD [15].

Acculturative stress is presumed to influence mental health. Whilst the preceding review of the literature highlighted the discrepant findings regarding the role of orientation on mental health in migrants and refugees, the specific relationship between acculturative stress and mental health is more consistent. The stress experienced in response to these migratory challenges is regularly identified as a significant risk factor for mental health problems [5, 18] and specifically associated with higher levels of PTSD symptoms [4, 6, 29], depressive symptoms [6, 29, 30] and anxiety symptoms [6, 31]. These relationships are often demonstrated even after accounting for the effect of pre-migratory traumatic exposure [31] and are found to be stronger among refugees who felt rejected by their host country [5], indicating a significant effect of acculturation on mental health.

Discordant findings into the association between acculturation and mental health are often attributed to a few different factors. The first relates to the variability of acculturation conceptualization and operationalization. While most researchers now agree on the bi-dimensional (i.e. two dimensions separately for ethnic and host orientation) as opposed to a uni-dimensional (i.e. one dimension ranging from ethnic to host orientation) conceptualisation of acculturation, operationalization of acculturation still varies and includes uni-dimensional, bi-dimensional and typographic (i.e. integration, assimilation, separation and marginalization categories) assessments of acculturation [32].

The second factor relates to the migrating context and specifically the cultural differences between ethnic and host culture that come into contact. If the host culture is not accepting and the social support from the original culture is unavailable, individuals experience a sense of rejection and alienation, with negative implications for their mental health [19]. The impact of the migrating context, however, has not been researched much and the focus is still predominantly on the individual ethnic groups as the principal drivers of the acculturative process.

Finally, the acculturation research has been criticized for its lack of generalizability, as most of the early empirical work was derived from early studies conducted with Asian and Hispanic cultures migrating to the United States [20]. Therefore, the previous research and the ethno-specific assessments of acculturation might not fully generalize to forcibly displaced populations, such as refugees who, first, experience different push and pull factors (e.g. pre-migratory exposure to traumas); second, come from different cultural backgrounds (e.g. African, Indo-European, Middle–Far Eastern); and third, migrate to different host societies that have different cultural and political environments (e.g. Europe, Australia). Indeed, the limited research conducted to date indicates that refugees live in societies with restrictive policies, lack choice in their acculturative strategy, struggle with adaptation, and remain vulnerable to psychosocial stress [33].

Overall, the literature reviewed suggests that both ethnic and host cultural orientations and acculturative stress may influence the mental health of refugees. While several mediational models have been tested with migrants examining the impact of acculturation on mental health [e.g. 34, 35], none of these have considered the impact of acculturative stress and cultural orientation in the same model among refugee populations. Prior integrated models conducted with migrants [36, 37] demonstrated a mediating role of acculturation level in the relationship between acculturative stress and depression. However, both of these models tested the assumption that acculturative levels impact acculturative stress, and not the other way around. This assumption contradicts the acculturative theory [16, 17], which proposes that acculturative stress is one of the underlying mechanisms of acculturation and is seen as the result of conflict arising out of contact and participation with the host culture during the acculturative process. Furthermore, both models uni-dimensional operationalization of acculturation have been criticised [21]. To our knowledge, no model has investigated the impact of exposure to traumatic events and the process of coping with acculturation and acculturative stress. Therefore, these models yield a limited evidence, failing to consider potential transitional mechanisms between pre-migratory traumatic exposure and post-migratory stressors and their impact on mental health.

The aim of the current study is to address this gap by investigating the relationship between traumatic exposure, acculturative stress, cultural orientation and their impact on mental health outcomes, in particular PTSD, depression and anxiety symptoms in two different migrating contexts. In particular, we will examine if, in a refugee sample, acculturative stress influences cultural orientation, and if ethnic and host cultural orientations mediate the relationship between traumatic exposure and mental health symptoms.

Method

Participants and procedure

Participants were eligible for inclusion in this study if they were older than 18 years, exposed to war in Bosnia and resided in Australia or Austria. Participants were recruited between January 2010 and January 2013 using “snow-ball-ing”, online, radio and newspapers advertising and recruitment through social clubs and associations. Monash University Human Research Ethics Committee approved this study (CF09/32382009001758).

Measures

The self-reported questionnaire included a set of demographic questions (age, gender, education and marital status). Traumatic exposure was a cumulative measure assessed with a set of trauma history questions using yes/no answers assessing exposure to war-related (e.g. torture, concentration camp, killing) and other traumatic events (e.g. exposure to disasters, accidents and assaults) experienced during the participant's lifetime.

Posttraumatic stress disorder

The Bosnian translation [38] of the Posttraumatic Stress Diagnostic Scale (PDS; Part 3 only) [39] (17 items) was used for the assessment of current PTSD symptomatology. The alpha coefficient for the current Bosnian version of the PDS in this sample was excellent ($\alpha = 0.97$).

Depression and anxiety symptoms

The Depression Anxiety Stress Scale (DASS-21) is a 21 item self-report inventory designed to provide measures of the three related negative affective states of depression, anxiety, and stress [40]. In the current study, only the depression and anxiety subscales were used to assess the presence of symptoms over the past two weeks. Recommended cut-off scores for convectional severity labels for depression and anxiety are normal (*D* 0–9; *A* 0–7), mild (*D* 10–13; *A* 8–9),

moderate (D 14–20; A 10–14), severe (D 21–27; A 15–19) and extremely severe (D 28+; A 20+). Alpha coefficients for the depression ($\alpha=0.95$) and anxiety ($\alpha=0.92$) subscales in the current sample were excellent.

Acculturation orientation

The Language, Identity and Behavior (LIB) acculturation scale [41] was used to assess acculturation orientation. The scale utilized three separate subscale scores for Language, Identity and Behavior to derive two overall total scores of acculturation orientation: host cultural orientation (Australian or Austrian) and ethnic cultural orientation (Bosnian). The Language subscale consists of 18 items asking participants to rate their ability to speak and understand host and native language. The Identity subscale consists of 14 statements measuring identification with ethnic and host cultures. The Behavior subscale includes 22 items asking participants to rate the extent to which they engage in behaviors associated with each culture. The Cronbach's coefficient for the host cultural orientation in this sample was 0.94 and ethnic cultural orientation was 0.92.

Acculturative stress

The Demands of Immigration Scale (DIS) [42] was used to measure acculturative stress experienced over the last 6 months. This scale includes multiple subscales relating to Loss (longing for people, places and things in the homeland), Novelty (unfamiliarity with the tasks of daily living), Occupation (difficulty finding acceptable work), Language accommodation (host language knowledge), Discrimination (perceived) and Not feeling at home (not feeling part of one's surrounding or social structure). The Cronbach's alpha for the total scale in this sample was excellent ($\alpha=0.94$).

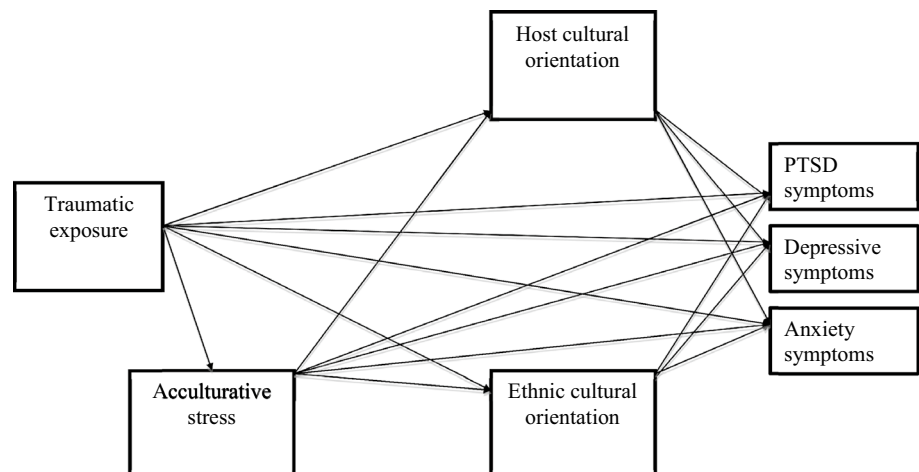
Statistical analyses

Descriptive and bivariate correlations were performed using SPSS version 22.0 [43]. Structural equation modeling (SEM) was performed in Mplus version 7.0.1 [44] testing direct and indirect effects. To complete the analysis, we identified two latent variables and five observed variables. The observed variables were traumatic exposure, levels of acculturative stress, PTSD, depressive and anxiety symptoms. The latent variables were host cultural orientation and ethnic cultural orientation. The latent variables were derived from the Language, Identity and Behavioural subscales of the LIB scale. Gender and length of residence were identified as potential confounding covariates and were controlled in all analyses.

We relied upon a variety of model fit indices to determine that the model defined adequately represented the data including the chi-squared goodness of fit, comparative fit index (CFI), the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR) [for discussion see: 45]. CFI values of >0.90 were regarded as favourable. RMSEA values ≤ 0.05 were considered a close approximate fit, values between 0.05 and 0.08 are considered reasonable and values ≥ 0.10 are indicative of poor model fit. Model results were estimated using robust maximum likelihood (MLR) estimation. MLR uses a sandwich estimator, which provides accurate standard errors, even in non-normally distributed data [46].

Figure 1 outlines a Model A that summarizes the hypothesized relationships defining acculturative stress and host and ethnic cultural orientations as mediators between traumatic exposure and mental health outcomes (i.e. depression, anxiety and posttraumatic stress). Gender and length of residence were included as controlling variables on mental health outcomes to allow for both gender differences in prevalence rates of PTSD, and evidence suggesting that length of residence in the host culture predicts anxiety and depressive symptoms.

Fig. 1 Proposed Model A of the relationships between traumatic exposure, acculturative stress, cultural orientations and mental health outcomes



Results

Participants

One hundred and thirty eight participants were recruited into the study with mean age of 40.20 years (range between 18 and 80 years). The majority were male ($n = 76$, 55%), married or in a relationship ($n = 99$, 72%), had obtained an advanced diploma or tertiary education ($n = 85$, 62%) and were employed in white collar or professional positions ($n = 57$, 42%). More participants resided in Austria ($n = 82$, 59%) than Australia ($n = 56$, 41%), with average residence duration of 17.66 (5.07) years. While an initial aim of this study was to account for the effects of different migrating contexts (i.e. multicultural versus monocultural acculturation preferences), this was not possible due to small sample sizes. Instead, all analyses were conducted using the total sample of participants, and wherever considered necessary, the potential confounding effects of migrating context (assessed as country of resettlement) was controlled for the analyses.

Eighty-two percent of the sample reported experiencing at least one traumatic event, while 70% reported experiencing three or more lifetime traumatic events. The most common war-related experiences reported by participants include experiencing separation from immediate family members ($n = 72$, 42%), direct bombardment or sniper fire ($n = 68$, 46%) or lack of food, shelter or medicine ($n = 68$, 46%) (see Table 1).

Table 1 Exposure to traumatic events reported by participants

Traumatic event	<i>n</i> (%)
Separation from immediate family	76 (55.1)
Direct bombardment or sniper fire	69 (50.0)
Lack of food, shelter, medicine	69 (50.0)
Other stressful event happened to family	56 (40.6)
Family member injured, killed or tortured	55 (39.9)
Other stressful or upsetting event	52 (37.7)
Life threatening accidents	41 (29.7)
Witnessed other people being harmed, tortured or killed	39 (28.3)
Serious physical attack or assault	34 (24.6)
Witnessed family injury, killing or torture	15 (10.9)
Fire, flood or natural disaster	14 (10.1)
Torture	12 (8.7)
Combat	10 (7.2)
Concentration camp	9 (6.5)
War-related serious injury	4 (2.9)

$n = 138$

Descriptive statistics

The majority of participants scored within the normal range category on PTSD, depressive and anxiety symptoms (Table 2). A minority of participants (10–15%) scored within the severe categories for all mental health indicators. It should be noted that these categories reflect participants' self-reported symptoms and do not serve as a diagnosis of disorder.

Table 3 presents the means, standard deviations and correlations among the variables of interest. There were significant correlations between traumatic exposure, acculturative stress, ethnic and host cultural orientation and mental health indicators.

Model estimation

SEM was used to examine the relationships in the proposed model. The initial testing of the model indicated a well-fitting Model A and good amount of variance predicting all mental health outcomes (Table 4). Specifically, significant direct relationship was identified between traumatic exposure and symptoms of PTSD, depression and anxiety symptoms. Furthermore, a significant indirect relationship was identified from traumatic exposure onto acculturative stress onto host- and ethnic-orientation. However, traumatic exposure did not predict host-cultural ($p = .176$) or ethnic cultural ($p = .882$) orientations, and acculturative stress did not

Table 2 PTSD, depressive and anxiety symptom severity scores

Symptoms	<i>n</i> (%)
Depressive symptoms	
Normal	89 (65)
Mild	7 (5)
Moderate	16 (12)
Severe	7 (5)
Extremely severe	9 (6)
Anxiety symptoms	
Normal	80 (58)
Mild	12 (9)
Moderate	16 (12)
Severe	7 (5)
Extremely severe	13 (9)
PTSD symptoms	
None/mild	83 (60)
Moderate	21 (15)
Moderate–severe	19 (14)
Severe	3 (2)

$n = 138$; Percentages do not always correspond to total N due to missing data

Table 3 Means, standard deviations, range and correlations amongst the variables of interest

	<i>M</i>	<i>SD</i>	Range	1	2	3	4	5	6	7
1. Traumatic exposure	5.09	4.03	0–16	1	0.378**	0.119	−0.179*	0.695**	0.600**	0.642**
2. Acculturative stress	50.10	18.40	14–92		1	0.325**	−0.744**	0.471**	0.367**	0.459**
3. Ethnic cultural orientation	88.72	12.80	46–108			1	−0.383**	0.208*	0.099	0.166
4. Host cultural orientation	79.81	18.00	28–112				1	−0.358**	−0.270**	−0.314
5. PTSD symptoms	8.58	11.57	0–50					1	0.722**	0.795**
6. Depressive symptoms	3.76	5.13	0–21						1	0.888**
7. Anxiety symptoms	3.41	4.52	0–21							1

PTSD: posttraumatic stress disorder; * $p < .05$, ** $p < .01$

Table 4 Fit indices for the path models of relations between traumatic exposure, acculturative stress, acculturation orientations, and PTSD, depressive and anxiety symptom severity

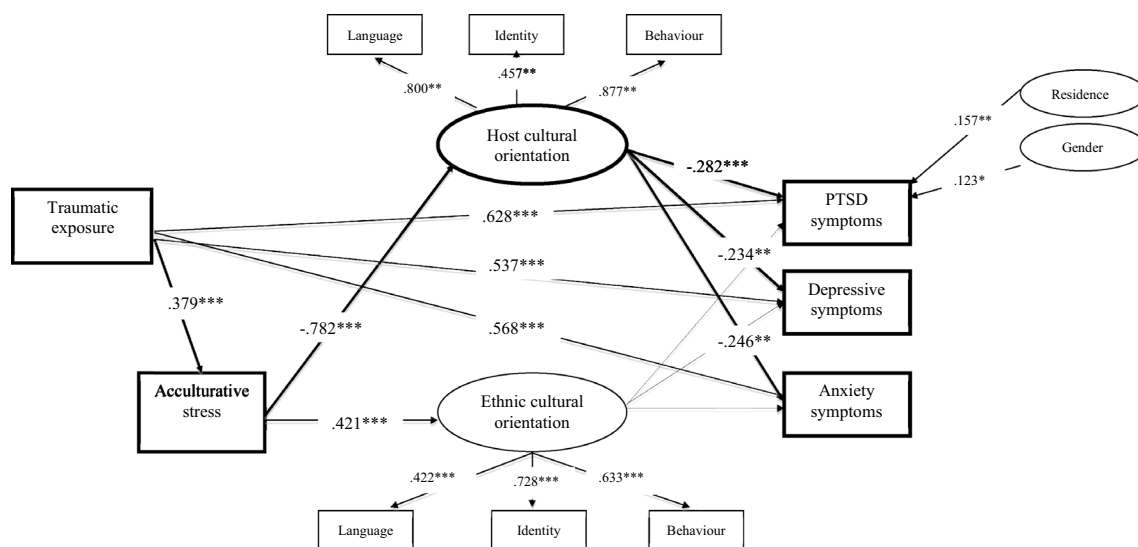
	Model A	Model B
Chi square	74.143 (43), $p = .002$	81.233 (48), $p = .002$
CFI	0.955	0.952
RMSEA	0.072	0.071
SRMR	0.059	0.060
Variance explained (R^2)		
PTSD symptoms	0.589	0.600
Depressive symptoms	0.397	0.408
Anxiety symptoms	0.462	0.472

df degrees of freedom; *CFI* comparative fit index; *RMSEA* root mean square error of approximation; *SRMR* standardised root mean square residual

predict symptoms of PTSD ($p = .301$), depression ($p = .918$) or anxiety symptoms ($p = .183$).

Therefore, under the rules of parsimony, which argues for simplicity, the model was re-specified based on the findings from Model A. Model B, the re-specified model, was the same as Model A with removal of the non-significant predictive relationships described above. Model B (see Fig. 2) tested a direct impact of trauma onto mental health outcomes and onto acculturative stress, but not onto ethnic and host cultural orientation. Furthermore, Model B tested a relationship from acculturative stress to ethnic and host cultural orientation, but not onto mental health. Finally, Model B also tested a relationship between ethnic- and host cultural orientations and mental health outcomes. In this model, PTSD symptoms, anxiety symptoms and depressive symptoms were separate measures of mental health.

The modified Model B showed an overall good fit and amount of variance predicting all mental health outcomes (see Table 4). When using MLR estimator in Mplus, the

**Fig. 2** Modified Model B with standardized regression beta coefficients. * $p < .05$, ** $p < .01$, *** $p < .001$. The model is controlled for by gender and length of residency. *PTSD* posttraumatic stress disorder symptoms

output can be analyzed to complete an equivalent of a Chi-square different test [47]. Running this analysis, the difference between Model A and Model B was $\chi^2(5)=6.98$, $p=.22$. These results all indicated that the performance of the Model B was not significantly different from the performance of Model A. Therefore, under rules of parsimony, Model B was selected as the preferred model.

As indicated in Fig. 2, factor loadings of the indicators of their respective latent construct were all significant and ranged from 0.422 to 0.877. Model B revealed significant direct effects from traumatic exposure to PTSD symptoms ($\beta=.628$, $p<.001$), from traumatic exposure to depressive symptoms ($\beta=.537$, $p<.001$) and from traumatic exposure to anxiety symptoms ($\beta=.568$, $p<.001$). Significant indirect effects were also identified from traumatic exposure via acculturative stress, via host-cultural orientation to PTSD ($\beta=.092$, $p=.001$), to depressive symptoms ($\beta=.091$, $p=.015$) and to anxiety symptoms ($\beta=.084$, $p=.016$) (see bold lines in Fig. 2). The analysis showed a significant positive relationship between traumatic exposure and acculturative stress, which was furthermore negatively associated with host-cultural orientation and positively with ethnic-cultural orientation. Finally, host-cultural orientation was negatively associated with PTSD, depression and anxiety symptoms, while the relationships with ethnic-cultural orientation were not significant.

Discussion

The findings of this study expand the current knowledge of refugee mental health in several aspects. First, the integrated statistical model utilised in this study incorporates the complexity of consecutive experiences associated with pre-migratory exposure to war-related traumatic events, migratory exposure to daily stressors or acculturative stress, and influence of cultural orientations towards ethnic and host cultures and their cumulative impact on mental health of refugees. Hence, the novelty of this model is the unifying approach to examining different influences on mental health of refugees across a migration journey.

Second, these findings contribute to the ongoing debate on whether pre-migratory traumatic exposure or post-migratory stressors are more central to the presentations of mental health problems in refugees. The tested model confirmed prior research [2, 3, 48] that traumatic experience itself is the crucial factor and has a direct effect on psychological stress of refugees. Bosnian refugees in this study reported high levels of exposure to war and other lifetime traumatic events that were directly associated with higher severity of mental health symptoms. These findings are consistent with other studies conducted with other refugee samples [2, 10] and other Bosnian refugee samples [4, 49, 50].

Third, the findings of this study elucidate the indirect roles of acculturative stress and cultural orientation in the relationship with refugees' mental health. Those refugees who experienced more events that are traumatic also reported more stress associated with acculturation in their host country. However, this experience of acculturative stress did not directly impact refugees' symptoms of PTSD, depression and anxiety as suggested in previous research [e.g. 4, 31]. One reason for this discrepancy in the findings reflects the fact that very few studies, prior to this, investigated direct versus indirect effects of acculturative stress on mental health. Hence, the results of the current model elucidate these relationships further, identifying that the relationship between acculturative stress and mental health of refugees is mediated by the cultural orientation of the individual, and in particular their host cultural orientation. Whilst the individual's orientation towards their own culture does not impact refugees' mental health, positive attitudes towards the host culture lessen the impact of prior trauma exposure and acculturative stress on mental health. This indirect relationship of acculturative stress via host cultural orientation is consistent with the assumptions offered by acculturation theory suggesting that stress experienced during acculturation is an underlying mechanism directly responsible for acculturation attitudes and preferences for cultural participation in the host culture [16, 18]. Therefore, the importance of acculturative stress in the relationship with refugees' mental health is not diminished, but instead underlined as a significant factor impacting the engagement with the host culture.

The findings also suggest that, when faced with more stress associated with acculturation, refugees are more likely to reject their host culture, which is detrimental to their mental health. The difference in the findings between host and cultural orientations may be related to the possibility that ethnic cultural orientation is related to some aspects of psychological adaptation rather than psychological distress or mental illness. This possibility has been suggested by Smith, Silva [51], who found that in 184 studies analyzed statistically in a meta-analysis, ethnic identity was twice as strongly related to positive personal attributes and preferences, such as self-esteem and wellbeing, than to measures of mental health such as depression and anxiety. This would suggest that ethnic cultural orientation is largely independent of mental health symptoms, especially those that may be precipitated by prior traumatic experiences, but nonetheless contributed to one's well-being.

Hence, this study advances prior research by helping to demonstrate the utility of interconnecting the psycho-socio-cultural paradigms when investigating mental health outcomes of refugees. Although prior integrated models conducted with migrant groups generated important knowledge about the impact of acculturation and acculturative stress on

mental health [36, 37] the current model tested with refugees further demonstrated that acculturative stress is the driving mechanism influencing host cultural orientation and indirectly affecting mental health. The results of this study, shed new light in this area of research and identify that traumatic exposure is still the strongest (both direct and indirect) predictor of symptoms of PTSD, depression and anxiety in refugees. While cultural orientation is an outcome of acculturative stress, it is not a significant predictor of mental health as concluded by earlier research [36, 37].

Furthermore, the assumption that ethnic groups can choose which acculturation style they want to adapt should be challenged. They may have little choice, as their experience depends on conditions of the host society (e.g. immigration policy). When separation or marginalization of the ethnic groups is sought or enforced by the host society, as opposed to promotion of cultural diversity and multiculturalism, this can lead to less favorable acculturative orientations of the ethnic group and potentially a detrimental effect on their mental health. Therefore, in addition to the acculturation orientations of individual ethnic groups and their role as the principal drivers of the acculturative process, future studies need to consider the role of the migrating context (e.g. multicultural versus monocultural acculturation preferences) and how they contribute to the relationship between acculturative stress, cultural orientation and mental health of refugees.

The results also highlight the importance of bi-dimensional conceptualization and operationalization of acculturation is also highlighted with these results. Assessing acculturation using separate indicators for host and ethnic cultural orientation, as recommended by experts [52, 53], can provide better understanding and refinement of the effects of each cultural orientation on different psychological and social outcomes.

Future research should promote psycho-socio-cultural models that investigate both acculturation and mental health of refugees. These models need to include trauma-related and socio-cultural factors, and investigate acculturation using bi-dimensional assessment tools. Furthermore, research investigating the impact of acculturative stress on cultural orientation and mental health might choose to investigate individual acculturative stressors separately (e.g. perceived discrimination, host language acquisition, loss of traditions). This is particularly desirable because there is evidence [54] to suggest that some domains of acculturative stress may hinder the recovery from traumatic exposure while others may support it.

Clinical implications

There are many benefits of the positive acculturation process for the mental health of refugees. Providing refugees

with long-term support aimed to improve economic, cultural and social acculturative stressors can lessen the impact of acculturative stress on refugees. One way to facilitate this adaptation is to alleviate the migratory stressors associated with functioning in the host society. Previous research indicates that only providing access and training opportunities is insufficient alone. Refugees experience access barriers due to limited social, language, gender and cultural issues and potentially even lack of pre-migration education and literacy [55]. At the levels of service systems, barriers experienced by refugees may include service complexity, bureaucracy and significant gaps in the service [56]. Addressing those barriers can be achieved through provision of active, culturally appropriate support for the acquisition of the host language, participation in the employment market, access to education and health services. Educating refugees about the importance of host cultural orientation and its influence on mental health and functioning should be two-way, and based on intercultural exchange rather than cultural imposition [56].

However, any such messages should not come at the expense of de-emphasizing the importance of the ethnic cultural orientation, which may be highly important for refugees' social adjustment and general psychological well-being. Finally, any such service implementation should be evaluated on the acceptability and efficacy for refugee populations, as currently there is very little evaluative research conducted with refugee populations [56].

Furthermore, practical issues such as education, employment and social inclusion should be addressed alongside effective and culturally responsive psychotherapy targeting pre-existing psychopathological risk factors including exposure to traumatic events [57]. This is particularly important considering that those factors remain the strongest predictors of mental health problems later in resettlement. Nonetheless, the contributing effect of acculturative stress and cultural and social stressors (e.g. language and cultural barriers) that are related to acculturation need to be considered as well, especially since they are significant impediments to constructive engagement with mental health services [57]. Therefore, developing services and policies that aim to promote successful adaptation of refugees should be multidisciplinary, targeting psycho-socio-cultural stressors, as they can influence and promote better mental health of refugees.

Limitations

The study included multiple limitations that need to be considered. The current study included a small convenience sample of Bosnian refugees who were well educated and predominantly married or in long-term relationships. As marriage is a protective factor and low-education is a

risk factor for pathology, caution should be exercised when generalizing these findings to other Bosnian cohorts. Furthermore, race and ethnic culture of the Bosnian refugees in the current study did not differ that much from their host cultures (i.e. Austrian and Australian). Thus, the generalizability of these results should be assessed with other refugee populations that have more cultural distance between their own ethnic and their host culture. Furthermore, differences may exist between acculturation orientation between Bosnian refugees resettled in Austria and Australia, which are due to different migrating conditions of the two host societies, and are not discernible here due to small sample sizes. Retrospective reporting and reliance on self-reporting may also run a risk of recall bias. Finally, the psychometric properties of some of the measures have not been assessed in Bosnian samples previously running a risk of implementing a measure that has not been validated with Bosnian refugees.

Conclusion

The integrated theoretical and statistical approach of this study enabled a more comprehensive assessment of complex and sequential pre- and post-migratory factors affecting mental health of refugees. The results demonstrated that the complexity of war traumas experienced by Bosnian refugees has a long-lasting influence on the psychological health of individuals. The importance of these traumas becomes even more evident when other migratory factors are considered. As refugees are faced with multiple stressors associated with acculturation to their country of resettlement, prior traumatic experiences continue to have a significant role in their adjustment to the new culture and society. The cumulative experience of prior traumatic exposure, together with everyday demands and stress associated with acculturation, evidently influence refugees' ability to effectively negotiate culturally appropriate behaviours in their host country, acquire the host language necessary to function and develop a sense of belonging and identification with the host culture.

In addition to the strong evidence indicating that war and forced migration predispose refugees to mental health problems, this study demonstrated how acculturative process further shapes the mental health of refugees. Specifically, while most studies of the mental health of refugees have focused on investigating how exposure to trauma, or acculturative stress, or acculturation influence mental health, this study identified a mechanism in which all of these factors function together to influence mental health. We confirmed that prior traumatic exposure still has the strongest negative effect on the mental health symptoms, with additional indirect effects of acculturative stress asserted via host cultural orientation. Notwithstanding the fact that refugees are inherently highly resilient as they are traumatised, the groups of refugees

resettling in countries around the world still seem to require a significant amount of assistance not only to overcome the obstacles of traumatic exposures, but also to start building a better life in countries with different cultures, languages and customs.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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