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Posttraumatic Stress Disorder and Psychiatric Co-morbidity among Syrian Refugees of Different Ages: the Role of Trauma Centrality

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Abstract It has been documented that trauma centrality is associated with posttraumatic stress disorder (PTSD) and psychiatric co-morbidity among Syrian refugees. Whether age would influence the levels of the above constructs and the association between trauma centrality and distress outcomes is unclear. This study compared age differences in 1) the levels of trauma centrality, posttraumatic stress disorder and psychiatric co-morbidity, and 2) models depicting the association between trauma centrality and distress outcomes among Syrian refugees. One thousand one hundred and ninety-seven refugees completed the Centrality of Event Scale, Harvard Trauma Questionnaire and General Health Questionnaire-28. Age groups were divided into young, middle-aged adults and adults of 45 or above. No significant group differences were found in the proportion of refugees meeting the diagnostic criteria for PTSD. Controlling for demographic variables, all subscales of trauma centrality and psychiatric co-morbidity were significantly different between groups. Young adults reported significantly less trauma centrality and psychiatric co-morbidity than the other groups. Multiple-indicator multiple-cause modelling showed that trauma centrality was significantly correlated with PTSD and psychiatric co-morbidity. Multi-group analysis showed the model for the young adult group to be significantly different from the middle-aged group model. To conclude, age did not seem to influence the severity of PTSD among Syrian refugees. The war had a less

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severe impact on young adults' sense of self and other psychological problems than those who were older. The way in which young and middle-aged adults responded to distress varied depending on environment and personal characteristics.

Introduction

The war in Syria has produced over 4 million refugees scattered all over the world and 8 million internally displaced refugees [1–4]. The prevalence rates for posttraumatic stress disorder (PTSD) have been estimated to range from 33.5 to 52% [5, 6]. Trauma centrality has been identified as a risk factor associated with PTSD and psychiatric co-morbidity among Syrian refugees resettled in Turkey [6]. It is also a risk factor for victims involved in other types of trauma e.g. [7–15].

Trauma centrality states that memories of war can act as a daily reminder of previous experiences of traumatic events and can have a re-traumatizing effect. Consequently, personal reference points from which meaning is attributed to existing beliefs, feelings, experiences and future expectations is affected. The memories have become a turning point, changing and redirecting the life story to the extent that personal identity has been re-defined or re-constructed. We could say the war trauma has become an integral part of the sense of self, leading to the emergence of a stable traumatized self across situations [16].

Whilst the relationship between trauma centrality, PTSD and psychiatric co-morbidity has been established among Syrian refugees [6], the extent to which age influences the levels of these constructs and the association between trauma centrality and distress outcomes is unclear. Addressing these knowledge gaps was the main aim of the current study. In terms of trauma centrality, accumulated life experiences would likely affect interpretation of the meaning of a trauma, thereby influencing emotional response to trauma [17–20]. For example, although older adults can manifest trauma centrality characteristics following a trauma [8, 9, 21–23], they are less likely than younger adults to construe the traumatic event as central to identity [22].

Evidence on age affecting PTSD and psychiatric co-morbidity is inconclusive in refugee studies. Older age seems to relate to long-lasting PTSD, depression and somatic complaints in a linear fashion [24–33]. Older Bosnian refugees have displayed a higher level of PTSD severity than younger ones [34] with the exception of those from Bosnia-Herzegovina [35]. Furthermore, one study showed that middle aged (40+) female Malian Refugees in Burkina Faso were prone to PTSD while younger (below 40) were equally distressed but more prone to other general psychological problems [36].

The current study aimed to examine age differences in 1) the levels of trauma centrality, PTSD and psychiatric co-morbidity, and 2) models of association between trauma centrality and distress outcomes among Syrian refugees. In the light of literature, we hypothesized that there would be age differences in the levels of trauma centrality, PTSD and co-morbidity, and that the association between them would vary depending on age. However, given inconclusive evidence in literature, it was difficult to hypothesize which age group would report higher levels in these constructs and how the association between them would vary in relation to age.

Methods

Procedure

Data collection for the current study took place in Turkey and Sweden. In a remote rural area inside Turkey near the border with Syria, refugees were recruited with the assistance of a non-profit humanitarian organization. The co-ordinator took us to nearby districts where refugees had been resettled. Every temporary shelter was visited. The purpose of the research was explained and informed consent sought. They were asked to complete the questionnaires described in the Measures section. Refugees were informed that information collected would be kept anonymous and that they were entitled to withdraw from the study at any time without giving a reason. In addition to collecting data from these districts, the organization also had access to a refugee camp near the border. Data were collected by randomly choosing different shelters within the refugee camp.

In Sweden, data collection took place in a small town southwest of the capital. Syrian refugees were accessed from the city library, two language centres, and a government-led residential area. Similar to the ethical procedure used in Turkey, the purpose of the research, anonymity of data, and voluntary participation were explained to refugees. After obtaining informed consent, they were invited to complete an identical questionnaire pack. The inclusion criteria for both populations were: 1) 18+ in age, 2) Syrian in ethnicity and 3) refugee status as a result of fleeing from Syria. All the questionnaires had gone through the back-translation procedure. Ethical approval for the study was granted by the Ethics Committee at Zayed University in the United Arab Emirates.

Measures

Demographic Information A demographic page was used to collect information on age, gender (1 = female, 2 = male), education level (1 = no education, 2 = primary, 3 = secondary, 4 = university education), marital status (1 = single, 2 = married, 3 = divorced, 4 = widowed), location of resettlement (1 = Sweden, 2 = Turkey), location within their respective countries (1 = community, 2 = camp), how long ago (in months) they left Syria, duration (in months) of stay, whether they fled alone or with immediate family members (1 = no family members, 2 = family members).

The Centrality of Event Scale [16] measures the extent to which the experience of a traumatic event (or a series of events) constitutes 1) a reference point from which refugees generated expectations for the future and attributed meaning to other events in their lives. It also measures whether the event was perceived as 2) a turning point in their lives and 3) a central component of personal identity. The rating scale of 1 = totally disagree to 5 = totally agree was used. The total trauma centrality score has an excellent Cronbach's α of 0.94. Based on the current sample, the α was 0.93.

The Harvard Trauma Questionnaire [37] measures PTSD symptoms (1 = not at all to 4 = all the time) using the DSM-IV diagnostic criteria. It is based on refugees' overall traumatic experience of fleeing from Syria. The total average symptom score of 2.5 or above would be indicative of meeting the PTSD diagnostic criteria. The α for the total score ranged from 0.87 to 0.90 depending on the sample. The questionnaire has 88% concordance with the clinical structured interview for PTSD. The present sample generated a total Cronbach's α score of 0.91.

The General Health Questionnaire-28 [38] estimates the likelihood of refugees being diagnosed as suffering from general psychiatric morbidity at interview using the rating scale of 1–2–3-4. The questionnaire yields four subscales: somatic problems, anxiety, social dysfunction and depression. Reliability coefficients for the total score ranged from 0.78 to 0.95 [39]. Based on the current sample, the Cronbach's α was 0.94 for the total score.

Statistical Analysis

Chi-square and multivariate ANOVA were used to compare age group differences in demographic variables, trauma centrality, PTSD and psychiatric co-morbidity. Least significant difference (LSD) post hoc analyses were used for multiple comparisons. Correlation coefficients (point biserial correlation included) were used to identify which demographic variables would be related to PTSD and psychiatric co-morbidity. Multiple-indicator multiple-cause (MIMIC) modelling was used to establish the inter-relationship between trauma centrality, PTSD and psychiatric co-morbidity with subsequent multi-group analyses to compare χ^2 differences in the modelling between age groups. Assumptions and diagnostics relating to multivariate normality, linearity and homoscedasticity were met. No outliers (Mahalanobis ≥ 3 S.D.) were detected during exploration of diagnostics.

Results

One thousand one hundred and ninety-seven refugees (F = 482, M = 715) participated in the study. Adapted from a study looking at terrorism [40], the age distribution of the present sample was: 18–29 (Young adults, $n = 544$), 30–44 (Middle-aged adults, $n = 450$), 45+ ($n = 203$). Age distribution differed significantly between location of resettlement. The groups also differed significantly in whether the data were collected from the camp or community, marital status, education level and whether they fled from Syria alone or with family members. Otherwise, the gender distribution, how long ago they fled Syria and duration of stay in respective countries were similar across groups. There were no significant differences between groups in terms of the proportion of refugees meeting the diagnostic criteria for PTSD. The prevalence rates ranged between 42 and 45% for the three age groups.

Before comparing the mean differences of trauma centrality, PTSD and psychiatric co-morbidity, correlation coefficients including point biserial correlation (r_{pb}) were carried out to ascertain whether demographic variables related to outcome variables (PTSD, psychiatric co-morbidity). Those with significant correlations would be controlled for in subsequent analysis. Taking account of the effect of demographic variables was thought to be necessary because demographic differences among refugees and "victim variables" have been shown to relate to PTSD severity and other distress outcomes [41, 42]. Significant correlations (mostly at $p < 0.01$) were found in location of resettlement (PTSD, $r_{pb} = 0.29$; co-morbidity, $r_{pb} = 0.29$), whether data were collected from the camp or community (PTSD, $r_{pb} = 0.25$; co-morbidity, $r_{pb} = 0.33$), gender (PTSD, $r_{pb} = -0.06$, $p < 0.05$; co-morbidity, $r_{pb} = -0.18$), education level (Dummy: school vs university, PTSD, $r_{pb} = -0.10$; co-morbidity, $r_{pb} = -0.17$), and whether they came alone or with family members (PTSD, $r_{pb} = 0.07$, $p < 0.05$; co-morbidity, $r_{pb} = 0.11$). After adjusting these variables, multivariate ANOVA showed that all subscales of trauma centrality and psychiatric co-morbidity were significantly different between groups. Pairwise

comparisons (LSD) showed that young adults reported significantly less trauma centrality and psychiatric co-morbid symptoms than the other groups at mostly $p < 0.01$ level. The mean total of PTSD did not differ significantly between groups which was expected given the non-significant group differences in PTSD diagnosis (see Table 1).

To analyse the impact of trauma centrality on PTSD and psychiatric co-morbidity, multiple-indicator multiple-cause (MIMIC) models of three groups were compared. It was important that the MIMIC model for the whole sample be established first. Full information maximum likelihood was used to examine all estimation of model parameters and fit statistics. The indices related to fit and error were examined for testing the overall fit of the models. Meeting the criteria as follows would indicate a good fit to the data: 1) a ratio of chi-square/d.f. under 3, 2) values of 0.95 or greater for the Tucker–Lewis Index (TLI), and 3) for the Incremental Fit Index (IFI), 4) a value of 0.06 or smaller for the root mean square error of approximation (RMSEA), 5) a value closer to 1 for the Comparative Fit Index

Table 1 Demographic variables and the means and standard deviations of trauma centrality, psychiatric co-morbidity and PTSD total

	Young adults (n = 544)		Middle-aged (n = 450)		Middle-aged/ older (n = 203)		χ^2	F(2,1189)	η^2
	N	%	N	%	N	%			
Turkey	330	61	225	50	80	39	29.50**	–	–
Sweden	214	39	225	50	123	61		–	–
Community	357	66	343	76	183	90	48.18**	–	–
Camp	187	34	107	24	20	10		–	–
Male	343	63	254	56	118	58	4.73	–	–
Female	201	37	196	44	85	42		–	–
Married[a]	192	35	303	67	169	83	178.72**	–	–
Single	330	61	98	22	12	6		–	–
Divorced	8	1	24	5	2	1		–	–
Widowed	14	3	25	6	20	10		–	–
Primary education[b]	35	6	64	14	37	18	13.65**	–	–
Secondary education[b]	241	44	201	45	78	39		–	–
University education[b]	263	48	173	38	74	36		–	–
Fled alone	93	17	108	24	25	12	14.54**	–	–
Fled with family	451	83	342	76	178	88		–	–
PTSD	238	44	191	42	91	45	0.36	–	–
No-PTSD	306	56	259	58	112	55		–	–
	Mean	SD	Mean	SD	Mean	SD			
How long ago fled Syria	22.92	13.29	23.39	12.78	22.57	14.04	–	0.30	–
Duration of stay	17.25	11.71	16.24	11.31	17.62	12.82	–	1.32	–
Centrality reference point	30.95	6.96	32.14	7.54	31.00	8.07	–	7.33**	0.01
Centrality turning point	19.98	4.70	20.96	4.73	20.55	5.35	–	6.98**	0.01
Centrality personal identity	27.44	6.31	28.39	6.34	27.67	7.07	–	4.97**	0.00
Somatic problems	15.83	5.07	17.20	5.64	18.06	5.53	–	20.35**	0.03
Anxiety	17.28	5.15	18.48	5.72	19.03	5.77	–	11.94**	0.02
Social dysfunction	16.25	4.48	17.59	5.05	18.32	4.65	–	15.73**	0.02
Depression	14.46	5.43	15.32	5.92	14.66	5.79	–	3.99*	0.00
PTSD total	37.51	10.74	36.73	11.69	37.86	12.51	–	2.49	0.00

*$p < 0.05$; **$p < 0.01$

[a] Dummy variables for χ^2 analysis: married vs not-married;

[b] 5, 12 and 14 refugees did not receive education for young, middle-aged and middle-aged/older groups respectively as well as dummy variables for χ^2 analysis: secondary school level vs university level

(CFI), and 6) the Normal Fit Index (NFI) and 7) a value for the Goodness of Fit Index (GFI) ≥ 0.95 was not recommended.

Due to space constraint, the estimated correlations between the variables with indicators used in the MIMIC model as a whole group are not shown here but available from the first author. To test the measurement aspect of the model, it was first fitted with indicators but with neither background variables (location of resettlement, location of data collection, gender, education level and whether they fled alone or with family) nor correlations between the residuals. Three item parcels were created for PTSD. The loadings of all reflective indicators were significantly different from zero ranging from 0.60 to 0.95. Modification indices suggested that the residuals on trauma centrality could correlate with PTSD and psychiatric co-morbidity. This corresponded to paths depicted in our hypotheses. This model fit indicated a slight departure from the observed covariance matrix and that predicted by the model (CMIN/DF = 4.64; TLI = 0.97; IFI = 0.98; RMSEA = 0.05, 90% CI = 0.04–0.06; CFI = 0.98; NFI = 0.98; GFI = 0.97).

This model, however, did not take account of background variables impacting PTSD and psychiatric co-morbidity. Their inclusion yielded a model of relatively poor fit (CMIN/DF = 6.53; TLI = 0.94; IFI = 0.96; RMSEA = 0.06, 90% CI = 0.06–0.07; CFI = 0.96; NFI = 0.95; GFI = 0.95). Further inspection of modification indices suggested the covariation between background variables and the residuals of trauma centrality, the error term of depression and where the data were collected, as well as the error term of anxiety and trauma centrality turning pointing. These modifications improved the model and generated the final model fit (CMIN/DF = 2.81; TLI = 0.98; IFI = 0.98; RMSEA = 0.03, 90% CI = 0.03–0.04; CFI = 0.98; NFI = 0.98; GFI = 0.98). With background variables adjusted, trauma centrality was significantly correlated with PTSD (standardized estimate = 0.60 $p < 0.001$) and psychiatric co-morbidity (standardized estimate = 0.91, $p < 0.001$) with 33% ($R^2 = 0.330$) and 65% ($R^2 = 0.650$) of the variances explained for PTSD and psychiatric co-morbidity respectively. The final model depicting estimates of standardised path coefficients was shown in Fig. 1. Only significant paths were included and the covariance relationships were not depicted in the model to simplify the presentation (see Fig. 1).

Multi-group analyses were then carried out to compare χ^2 differences between the three models. The young adult group was significantly different from the middle-aged group
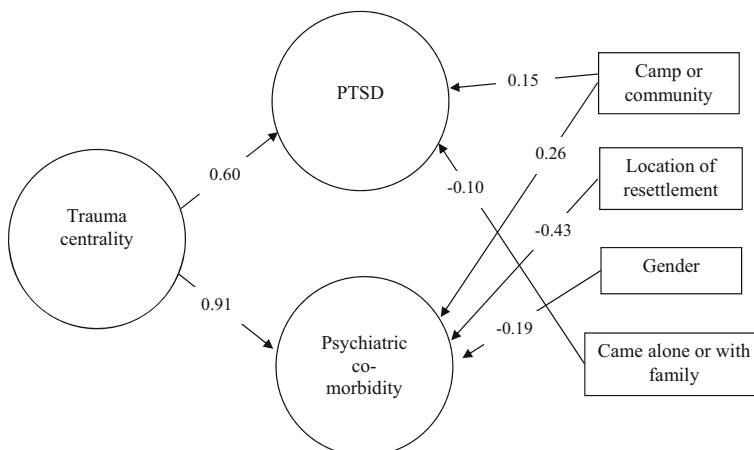
Fig. 1 The final MIMIC model for the whole sample. All paths shown are significant at 5% or better

(CMIN = 41.68, df = 19, $p < 0.01$) (see Figs. 2 and 3). Otherwise, there were no significant differences between young and adults of 45+ (CMIN = 21.72, df = 19, ns) and middle-aged and 45+ adults (CMIN = 25.93, df = 19, ns). Further analyses were carried out to look at the differences between the young adults and middle-aged groups. For the young adults group, both PTSD and psychiatric co-morbidity were related to whether the refugees were recruited from the camp or community and Sweden or Turkey. Those who were recruited from the camp reported significantly more PTSD (community mean = 33.17, SD = 9.95 vs camp mean = 40.02, SD = 7.99, $t = -8.05$, $p < 0.001$) and psychiatric co-morbid symptoms (community mean = 59.56, SD = 15.81 vs camp mean = 63.67, SD = 15.39, $t = -2.74$, $p < 0.01$) than those who were resettled in the community. Those who were resettled in Turkey reported significantly more PTSD (Sweden mean = 32.28, SD = 9.91 vs Turkey mean = 40.90, SD = 9.87, $t = -9.93$, $p < 0.001$) and psychiatric co-morbid symptoms (Sweden mean = 57.70, SD = 15.63 vs Turkey mean = 67.82, SD = 16.66, $t = -7.09$, $p < 0.001$).

For the young adult group, gender was associated with psychiatric co-morbidity. Women reported significantly more psychiatric co-morbid symptoms than men (women mean = 66,54, SD = 17.44 vs men mean = 62.25, SD = 16.53, $t = 2.85$, $p < 0.01$). The middle-aged group revealed that gender was related to both distress outcomes. Women reported significantly more PTSD (women mean = 38.00, SD = 11.67 vs men mean = 35.75, SD = 11.63, $t = 2.03$, $p < 0.05$) and psychiatric co-morbid symptoms than men (women mean = 74.03, SD = 19.22 vs men mean = 64.41, SD = 17.81, $t = 5.48$, $p < 0.001$).

Discussion

This study examined age differences in the levels of trauma centrality, PTSD and psychiatric co-morbidity and models of association between trauma centrality and outcomes among Syrian refugees. Significant differences between age groups in the proportion of refugees meeting the PTSD diagnosis were not established. Young adults reported significantly less trauma centrality and psychiatric co-morbid symptoms than the other groups. As a whole
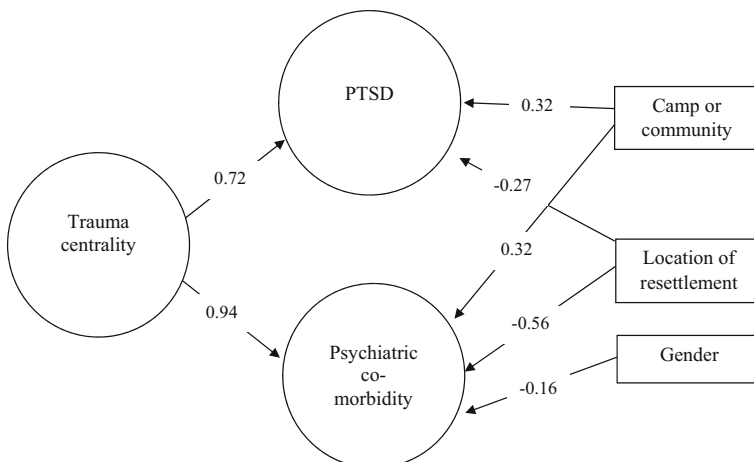
Fig. 2 The MIMIC model for young adults
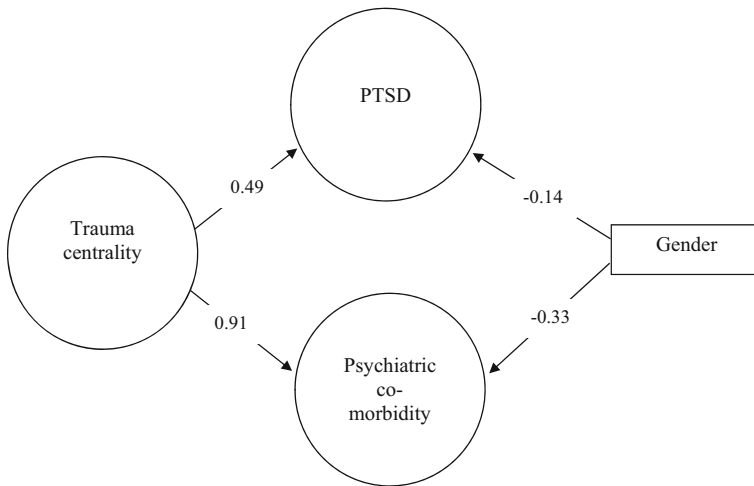
Fig. 3 The MIMIC model for middle-aged adults

group, trauma centrality was positively correlated with PTSD and psychiatric co-morbidity. The models of the association significantly differed between young and middle-aged adults.

The lack of significant age differences in the prevalence rates of PTSD has been reflected in literature [43]. Several studies have highlighted the same finding among victims of technological disasters [44], combat [45], military conflict and terror attacks [46], severe injury [47], flooding resulting from the collapse of a dam [48] and other traumatic life events [49]. Our findings confirmed a general conclusion that age effect on PTSD severity was inconsistent [50].

Despite the non-significant differences between age groups in PTSD prevalence, compared to refugees of middle age and 45+, young refugees were more resilient with a significantly lower level of trauma centrality and psychiatric co-morbid symptoms. In other words, compared to those who were older, the war seemed to have impacted to a lesser degree the way young adults attributed meaning to other events in their lives, their outlook on life and personal identity, and psychological well-being. This contradicts literature suggesting that young adults are more likely to construe a traumatic event as central to identity than older adults [22].

This notion of resilience among young adults could be related to their future ambition. During our contact with the refugees, we gathered anecdotal evidence that young adults, in particular, saw their current situation as a temporary solution. They were planning on returning and rebuilding their country. To what extent this ambition might have reduced the effects of trauma centrality and psychiatric co-morbidity needs to be investigated. From the perspective of Erikson's [51] developmental stages, young refugees would have just left behind their adolescenthood and begun a generativity stage of wishing to find a productive career, maintain well-being and contribute to the development of society (rebuilding Syria, for the current sample). Resilience could have been inherent, despite the interruption of the ego developmental process by the war. For resilience to rise above such interruption implies a strong sense of co-vitality which could have developed during adolescenthood and continued to young adulthood. Co-vitality is characterized by positive mental health that can emerge within adversity due to positive psychological building blocks [52].

On the other hand, staying with Erikson's [51] developmental stages, adults of middle-age and 45+ could have found themselves in the stagnation stage whereby they experience a lack

of productivity as a result of the war. This could have led to despair, failure in life and a feeling of being too late to start all over again. In addition, according to socioemotional selectivity theory [53], the process of ageing can lead to an increased tendency to be selective in emotional activities and therefore to prefer positive over negative affects. Consequently, through ageing, people tend to narrow their social interaction or network by spending time with familiar people in familiar surroundings, maximizing positive emotional experiences and minimizing emotional risk. However, the war had shattered this network and its emotional security. Furthermore, the war had destroyed their homes, a stable relationship with their own community and employment, and financial resources which led to a major assault on personal efficacy. According to the Conservation of Resources theory [54], these are important resources for survival and well-being that humans innately want to develop, conserve, and protect. The combination of these factors would have created a great deal of distress particularly for those who were older [51]. According to the age-related differential vulnerability hypothesis [55, 56], vulnerability, difficulty in adaptability and coping would have emerged for these people. In turn, the ability to buffer against the impact of the trauma on their concept of self and secure psychological well-being would have been affected.

In terms of the models depicting whether trauma centrality was associated with PTSD and psychiatric co-morbidity, there were significant differences between young adults and middle-aged adults. The two models were differentiated by demographic variables. Young adults were seemingly more volatile than middle-aged adults in the sense that their response to distress varied depending on the environment. Arguably, this is not too surprising given that young adults would have been experiencing the "emerging adulthood" transition characterized by identity explorations, feelings of instability or "in-between", self-focus or possibilities [57]. They tend to be more sensitive than older adults in responding to emotional stimuli, especially negative and fearful stimuli. People who are older, on the other hand, tend to have greater control over emotional reactions [58]. This might be why young adults responded to the fearful or traumatic stimuli across settings.

The association between gender and distress outcomes supported research pointing to a higher prevalence of PTSD among women [59]. For young adults, female gender was related to psychiatric co-morbidity but not PTSD which was in line with women refugees from Chechnya, Afghanistan and West Africa. Women were similar to men in PTSD but differed in somatic problems [60]. Middle-aged women seemed to be prone to a wider range of symptoms, both PTSD and psychiatric co-morbidity, than young adult women. Erikson's stagnation stage and the Conservation of Resources theory for middle-aged refugees mentioned earlier might account for their response to wider symptoms. Not withstanding this, mental health issues pertaining to middle-aged women could also have played a role [61].

Several limitations of the study need to be acknowledged. Firstly, the prevalence rates for the different age groups were estimated using a screening measure. A structured clinical interview could have yielded different results although the Harvard Trauma Questionnaire has an excellent concordance rate with the clinical structured interview. Using an interview method to assess the same sample size required for this study would have been extremely labour intensive. Secondly, the inclusion of adolescents would have given us more information on age differences in trauma centrality, PTSD and psychiatric co-morbidity. Differences between adolescents and older people in buffering against stress have been demonstrated in literature [62]. Thirdly, the convenience sampling strategy would have meant a possibility of sample bias. Whilst some refugees would have volunteered for the study with the intention to debrief, others would have avoided participating due to PTSD avoidance symptoms. Finally,

information on resettlement stress would have been useful, as it possibly played a role in distress outcomes.

To conclude, the severity of PTSD among Syrian refugees was not influenced by age. However, young adult refugees were more resilient than older ones in protecting themselves by buffering against the impact of the war on their sense of self and other psychological problems. Environmental contexts and personal characteristics influenced the way in which young adults and middle-aged adults responded to distress.

Compliance with Ethical Standards

Conflict of Interests All authors declare that they have no conflicts of interest.

Ethical Approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all participants included in the study.

References

1. Jefee-Bahloul H, Barkil-Oteo A, Pless-Mulloli T, Fouad FM. Mental health in the Syrian crisis: beyond immediate relief. Lancet. 2015;386(10003):1531.
2. Nassan M, Frye MA, Adi A, Alarcon RD. Telepsychiatry for post-traumatic stress disorder: a call for action in the Syrian conflict. Lancet Psychiatry. 2015;2(10):866.
3. Khalil RB. Where all and nothing is about mental health: beyond posttraumatic stress disorder for displaced Syrians. Am J Psychiatry. 2013;170(12):1396–7.
4. Refugees UNHCf. Syria Regional Refugee Response: Inter-agency Information 2015. Available from: http://data.unhcr.org/syrianrefugees/.
5. Alpak G, Unal A, Bulbul F, Sagaltici E, Bez Y, Altindag A, et al. Post-traumatic stress disorder among Syrian refugees in Turkey: a cross-sectional study. Int J Psychiatry Clin Pract. 2015;19(1):45–50.
6. Chung MC, AlQarni N, Al Muhairi S, Mitchell B. The relationship between trauma centrality, self-efficacy, posttraumatic stress and psychiatric co-morbidity among Syrian refugees: is gender a moderator? J Psychiatr Res. 2017;94:107–15.
7. Bernard JD, Whittles RL, Kertz SJ, Burke PA. Trauma and event centrality: valence and incorporation into identity influence well-being more than exposure. Psychol Trauma. 2015;7(1):11–7.
8. Ogle CM, Rubin DC, Siegler IC. Cumulative exposure to traumatic events in older adults. Aging Ment Health. 2014;18(3):316–25.
9. Ogle CM, Rubin DC, Siegler IC. Maladaptive trauma appraisals mediate the relation between attachment anxiety and PTSD symptom severity. Psychol Trauma. 2016;8(3):301–9.
10. Blix I, Solberg O, Heir T. Centrality of event and symptoms of posttraumatic stress disorder after the 2011 Oslo bombing attack. Appl Cogn Psychol. 2014;28(2):249–53.
11. Boals A. Using event centrality to predict depressive symptoms after a romantic conflict: a prospective design. Appl Cogn Psychol. 2014;28(2):259–65.
12. Groleau JM, Calhoun LG, Cann A, Tedeschi RG. The role of centrality of events in posttraumatic distress and posttraumatic growth. Psychol Trauma. 2013;5(5):477–83.
13. Lancaster SL, Klein KR, Nadia C, Szabo L, Mogerman B. An integrated model of posttraumatic stress and growth. J Trauma Dissociation. 2015;16(4):399–418.
14. Roland AG, Currier JM, Rojas-Flores L, Herrera S. Event centrality and posttraumatic outcomes in the context of pervasive violence: a study of teachers in El Salvador. Anxiety Stress Copin. 2014;27(3):335–46.

15. Allbaugh LJ, Wright MOD, Folger SF. The role of repetitive thought in determining posttraumatic growth and distress following interpersonal trauma. Anxiety Stress Copin. 2016;29(1):21–37.

16. Berntsen D, Rubin DC. The centrality of event scale: a measure of integrating a trauma into one's identity and its relation to post-traumatic stress disorder symptoms. Behav Res Ther. 2006;44(2):219–31.

17. Baltes PB, Nesselroade JR. Paradigm lost and paradigm regained: critique of Dannefer's portrayal of life-span developmental psychology. Am Sociol Rev. 1984;49:841–7.

18. Baltes PB, Reese HW, Lipsitt LP. Life-span developmental psychology. Annu Rev Psychol. 1980;31:65–110.

19. Charles ST, Mather M, Carstensen LL. Aging and emotional memory: the forgettable nature of negative images for older adults. J Exp Psychol Gen. 2003;132:310–24.

20. Urry HL, Gross JJ. Emotion regulation in older age. Curr Dir Psychol Sci. 2010;19:352–7.

21. Berntsen D, Rubin DC. Flashbulb memories and posttraumatic stress reactions across the life span: age-related effects of the German occupation of Denmark during world war II. Psychol Aging. 2006;21(1):127–39.

22. Boals A, Hayslip B Jr, Knowles LR, Banks JB. Perceiving a negative event as central to one's identity partially mediates age differences in posttraumatic stress disorder symptoms. J Aging Health. 2012;24(3):459–74.

23. Ogle CM, Rubin DC, Siegler IC. Accounting for posttraumatic stress disorder symptom severity with pre- and posttrauma measures: a longitudinal study of older adults. Clin Psychol Sci. 2016;4(2):272–86.

24. Shannon PJ, Vinson GA, Wieling E, Cook T, Letts J. Torture, war trauma, and mental health symptoms of newly arrived Karen refugees. J Loss Trauma. 2015;20(6):577–90.

25. Kroll J, Yusuf AI, Fujiwara K. Psychoses, PTSD, and depression in Somali refugees in Minnesota. Soc Psychiatry Psychiatr Epidemiol. 2011;46(6):481–93.

26. Robertson CL, Halcon L, Savik K, Johnson D, Spring M, Butcher J, et al. Somali and Oromo refugee women: trauma and associated factors. J Adv Nurs. 2006;56(6):577–87.

27. Ai AL, Peterson C. Symptoms, religious coping, and positive attitudes of refugees from Kosovar War. Corales, Thomas A [Ed] (2005) Focus on posttraumatic stress disorder research (pp 123–156) xi, 279 pp Hauppauge, NY, US: Nova Science Publishers; US. 2005:123–56.

28. Marshall GN, Schell TL, Elliott MN, Berthold S, Chun C-A. Mental health of Cambodian refugees 2 decades after resettlement in the United States. JAMA. 2005;294(5):571–9.

29. Bogic M, Ajdukovic D, Bremner S, Franciskovic T, Galeazzi GM, Kucukalic A, et al. Factors associated with mental disorders in long-settled war refugees: refugees from the former Yugoslavia in Germany, Italy and the UK. Br J Psychiatry. 2012;200(3):216–23.

30. Hinton W, Tiet Q, Tran CG, Chesney M. Predictors of depression among refugees from Vietnam: a longitudinal study of new arrivals. J Nerv Ment Dis. 1997;185(1):39–45.

31. Elhabiby MM, Radwan DN, Okasha TA, El-Desouky ED. Psychiatric disorders among a sample of internally displaced persons in South Darfur. Int J Soc Psychiatry. 2015;61(4):358–62.

32. Priebe S, Gavrilovic JJ, Bremner S, Ajdukovic D, Franciskovic T, Galeazzi GM, et al. Psychological symptoms as long-term consequences of war experiences. Psychopathology. 2012;46(1):45–54.

33. Molsa M, Punamaki R-L, Saarni SI, Tiilikainen M, Kuittinen S, Honkasalo M-L. Mental and somatic health and pre- and post-migration factors among older Somali refugees in Finland. Transcult Psychiatry. 2014;51(4):499–525.

34. Weine SM, Becker DF, Vojvoda D, Hodzic E, Sawyer M, Hyman L, et al. Individual change after genocide in Bosnian survivors of "ethnic cleansing": assessing personality dysfunction. J Trauma Stress. 1998;11(1):147–53.

35. Drozdek B. Follow-up study of concentration camp survivors from Bosnia-Herzegovina: three years later. J Nerv Ment Dis. 1997;185(11):690–4.

36. Carta MG, Oumar F, Moro M, Moro D, Preti A, Mereu A, et al. Trauma- and stressor related disorders in the Tuareg refugees of a camp in Burkina Faso. Clin Pract Epidemiol Ment Health. 2013;9:189–95.

37. Mollica R, Caspi-Yavin Y, Bollini P, Truong T, Tor S, Lavelle J. The Harvard trauma questionnaire: validating a cross-cultural instrument for measuring torture, trauma and posttraumatic stress disorder in indochinese refugees. J Nerv Ment Dis. 1992;180:111–6.

38. Goldberg D, Hillier V. A scaled version of the general health questionnaire. Psychol Med. 1979;9:139–45.

39. Goldberg D, Bridges KW. Screening for psychiatric illness in general practice: the general practitioner versus the screening questionnaire. J Royal College Gen Pract. 1987;37:15–8.

40. Scott SB. A lifespan perspective on terrorism: age differences in trajectories of response to 9/11. Dev Psychol. 2013;49:986–98.

41. Friedman M, Keane T, Resick P. Handbook of PTSD: science and practice. New York: Guilford; 2007.

42. Vogt D, King D, King L. Risk pathways in PTSD: making sense of the literature. In: Friedman M, Kean T, Resick P, editors. Handbook of PTSD: science and practice. New York: Guildford; 2007. p. 99–116.

43. Weintraub D, Ruskin PE. Posttraumatic stress disorder in the elderly: a review. Harv Rev Psychiatry. 1999;7:144–52.

44. Chung MC, Dennis I, Easthope Y, Farmer S, Werrett J. Differentiating posttraumatic stress between elderly and younger residents. Psychiatry. 2005;68(2):164–73.
45. Chatterjee S, Rath ME, Spiro A, Eisen S, Sloan KL, Rosen AK. Gender differences in veterans health administration mental health service use: effects of age and psychiatric diagnosis. Womens Health Issues. 2009;19:176–84.
46. Lahad M, Leykin D. Ongoing exposure versus intense periodic exposure to military conflict and terror attacks in Israel. J Trauma Stress. 2010;23:691–8.
47. Chung MC, Preveza E, Papandreou K, Prevezas N. Spinal cord injury, posttraumatic stress, and locus of control among the elderly: a comparison with young and middle-aged patients. Psychiatry. 2006;69(1):69–80.
48. Green BL, Gleser GC, Lindy JD, Grace MC, Leonard A. Age-related reactions to the Buffalo Creek Dam collapse: effects in the second decade. In: Ruskin PE, Talbott JA, editors. Aging and posttraumatic stress disorder. Washington, D.C: American Psychiatric Press; 1996.
49. Spitzer C, Barnow S, Völzke H, John U, Freyberger HJ, Grabe HJ. Trauma and posttraumatic stress disorder in the elderly: findings from a German community study. J Clin Psychiatry. 2008;69:693–700.
50. Norris FH, Kaniasty K, Conrad M, Inman GL, Murphy AD. Placing age differences in cultural context: a comparison of the effects of age on PTSD after disasters in the United States, Mexico and Poland. J Clin Geropsychol. 2002;8:153–73.
51. Erikson EH. Identity: youth and crisis. New York: Norton; 1968.
52. Renshaw TL, Furlong MJ, Dowdy E, Rebelez J, Smith DC. Covitality: a synergistic conception of adolescents' mental health. In: Furlong MJ, Gilman R, Huebner ES, editors. Handbook of positive psychology in schools. New York: Routledge; 2014.
53. Carstensen LL, Fung H, Charles S. Socioemotional selectivity theory and the regulation of emotion in the second half of life. Motiv Emot. 2003;27:103–23.
54. Hobfoll SE. Conservation of resources: a new attempt at conceptualizing stress. Am Psychol. 1989;44:513–24.
55. Elwell F, Maltbie-Crannel AD. The impact of role loss upon coping resources and life satisfaction of the elderly. J Gerontol. 1981;36:223–32.
56. Fillenbaum GG. An examination of the vulnerability hypothesis. Int J Aging Hum Dev. 1977–1978;8:155–60.
57. Arnett JJ. Emerging adulthood in Europe: a response to Bynner. J Youth Stud. 2006;9:111–23.
58. Tanner JL, Arnett JJ. The emergence of "emerging adulthood": the new life stage between adolescence and young adulthood. In: Furlong A, editor. Handbook of youth and young adulthood. London: Routledge; 2009. p. 39–45.
59. Kimerling R, Ouimette P, Weitlauf JC. Gender issues in PTSD. In: Friedman MJ, Keane TM, Resick PA, editors. Handbook of PTSD: science and practice. New York: The Guilford Press; 2007. p. 207–28.
60. Renner W, Salem I. Post-traumatic stress in asylum seekers and refugees from Chechnya, Afghanistan, and West Africa: gender differences in symptomatology and coping. Int J Soc Psychiatry. 2009;55(2):99–108.
61. Malatesta VJ. Introduction: the need to address older women's mental health issues. J Women Aging. 2007;19(1–2):1–12.
62. Chung MC, Jalal S, Khan NU. Posttraumatic stress symptoms, co-morbid psychiatric symptoms and distorted cognitions among flood victims of different ages. J Ment Health. 2016;

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