

Somatic distress among Syrian refugees in Istanbul, Turkey: a cross-sectional study

McGrath M. Department of Health Services Research and Policy, Faculty of Public Health and Policy, London School of Hygiene & Tropical Medicine; michael.mcgrath@lshtm.ac.uk

Acarturk C. Department of Psychology, Koç University, Istanbul; zacarturk@ku.edu.tr

* **Roberts B.** Department of Health Services Research and Policy, Faculty of Public Health and Policy, London School of Hygiene & Tropical Medicine; bayard.roberts@lshtm.ac.uk

Ilkkursun Z. Department of Psychology, Koç University, Istanbul

Sondorp E. KIT Royal Tropical Institute, Amsterdam; e.sondorp@kit.nl

Sijbrandij M. Department of Clinical, Neuro and Developmental Psychology, Public Health research institute, Vrije Universiteit, Amsterdam; e.m.sijbrandij@vu.nl

Cuijpers P. Department of Clinical, Neuro and Developmental Psychology, Amsterdam Public Health research institute, Vrije Universiteit, Amsterdam; p.cuijpers@vu.nl

Ventevogel P. Public Health Section, Division of Programme Management and Support, United Nations High Commissioner for Refugees, Geneva; ventevog@unhcr.org

McKee M. Department of Health Services Research and Policy, Faculty of Public Health and Policy, London School of Hygiene & Tropical Medicine; martin.mckee@lshtm.ac.uk

Fuhr D.C. Department of Health Services Research and Policy, Faculty of Public Health and Policy, London School of Hygiene & Tropical Medicine; daniela.fuhr@lshtm.ac.uk

Objective: Turkey is now the world's largest refugee hosting country. Conflict-affected populations in low- and middle-income countries experience a substantial burden of poor mental health. While there is emerging evidence regarding the prevalence and risk factors for common mental health disorders among Syrian refugees in Turkey, somatic distress remains unexamined. Our aim is to describe the prevalence and patterns of somatic distress among Syrian refugees living in a district of Istanbul, Turkey.

Methods: We conducted a cross-sectional survey of 1,678 adult Syrians registered for temporary protection in Istanbul. The survey recorded sociodemographic characteristics, health service utilisation, post-displacement stressors, somatic symptom severity (Patient

Health Questionnaire 15), and the symptoms of posttraumatic stress (PTSD Checklist 5), depression and anxiety (Hopkins Symptom Checklist).

Results: 42% of respondents experienced high levels of somatic distress and this was higher in people with symptoms of depression (70%), anxiety (75%), and posttraumatic stress disorder (73%), than in those without symptoms of any of these three conditions (20%).

Factors associated with increased somatic symptom severity included being female ($OR = 2.91$, 95%CI [2.32-3.63]), living with a chronic illness ($OR = 2.87$ [2.28-3.61]), and having a family member living with mental illness ($OR = 1.65$ [1.30-2.09]), while increased years of education was negatively associated with somatic distress ($OR = 0.95$, [0.93-0.98]).

Conclusion: Syrian refugees in Istanbul, particularly those with symptoms of common mental health disorders, experience a substantial burden of somatic distress. This impacts individual suffering and functioning, and has implications for health system planning and delivery.

Keywords: refugee; conflict; somatic distress; Syria; Patient Health Questionnaire 15

Introduction

Since the outbreak of conflict in 2011, 6.7 million people have fled Syria in search of protection (1). The majority have sought asylum in neighbouring low- and middle-income countries and, as of November 2019, Turkey hosts 3.7 million Syrians registered for temporary protection (2). The ongoing war and subsequent displacement has exposed this population to a range of potentially traumatic events, including experiences of combat and other violence, separation from family, destruction of property, religious and ethnic persecution, impoverishment, and a lack of food, water and shelter (3, 4). Many of those who arrived in Turkey have also experienced difficulties accessing health and social services, uncertainty around their legal rights, high levels of poverty and unemployment, and a lack of social support (5-7).

These pre- and post-displacement factors have been linked to psychological distress in refugee populations in many settings (8). The most recent data report a prevalence of mental disorders (depression, anxiety, posttraumatic stress disorder (PTSD), bipolar disorder, and schizophrenia) among conflict-affected populations of 22% but estimates vary considerably by study design and affected population (9). Surveys of Syrian refugees hosted in low- and middle-income countries of the Middle East report somewhat higher figures, with estimates ranging from 36-65% for depression, 35-44% for anxiety, and 20-83% for PTSD (10-16).

These common mental disorders have attracted most attention in conflict-affected and displaced populations, while less attention has been given to examining patterns of somatic distress. Yet physical symptoms are often the reason people with mental health problems first present to health services in low- and middle-income countries (17) and this is likely also the case for Syrians (18). There are several reasons for this lack of attention. The classification of somatisation within psychiatric nosology has evolved, its pathophysiology is complex, and

substantial overlap exists between somatisation and common mental disorders in terms of both prevalence and aetiology (19, 20).

Nevertheless, measuring somatic symptoms and severity is important for the assessment, prevention and treatment of psychological trauma and common mental disorders following humanitarian crises (21) and has proven to be a valid construct across cultures (22). When somatic distress has been examined in conflict-affected and displaced populations, it has been shown to limit daily functioning (23), reduce quality of life (24) and increase health service utilisation (25). Thus, an improved understanding of this phenomenon in these populations is likely to be important for reducing individual suffering, increasing health service efficiency and closing the mental health treatment gap. However, to the best of our knowledge, somatic distress has not been measured for Syrian refugees living in Turkey, or indeed elsewhere in the Middle East.

The aim of this paper is to (i) describe the prevalence and patterns of somatic distress observed in Syrian refugees living in a district of Istanbul, Turkey, and (ii) examine the association between somatic distress and socio-economic characteristics, post-displacement stressors, and anxiety, depression and PTSD.

Methods

Participants:

Between February and May 2018, we conducted a cross-sectional survey of adult Syrians registered for temporary protection in the Sultanbeyli district of Istanbul, Turkey. As of November 2019, 552,080 Syrians were registered in Istanbul, representing 15.0% of Turkey's registered Syrian refugee population (2). Sultanbeyli is one of Istanbul's poorest districts and contains the largest concentration of Syrian refugees on the Asian side of the city (6).

All eligible participants were selected using simple random sampling from the sampling frame of the Sultanbeyli municipal register [of Syrian refugees](#), with individuals as the unit of randomisation rather than households. [We selected 2,865 names at random from the register of over 20,000 people to reach a minimum required sample size of 1,444. Full details of the sample size estimation have been published elsewhere](#) (16). Randomly selected individuals were then contacted by telephone, with up to three follow-up calls made to those who could not be reached. ~~For inclusion, participants were required to be: native Arabic speakers, 18 years and older and, in the opinion of trained enumerators, not under the influence of alcohol or drugs, and without severe mental or intellectual impairment. For inclusion, participants were required to be native Arabic speakers and had to be 18 years and older. Enumerators received training on when to exclude participants and this included participants currently under the influence of alcohol or drugs (e.g. showing signs of intoxication), and participants with severe intellectual impairments who were unable to follow and respond to the survey questionnaire.~~

Procedure:

A 247-item questionnaire was designed in English. The survey questionnaire underwent a thorough adaptation and translation process to help ensure reliability, validity, and appropriateness for the study population, based on best practice procedures (26, 27). This included translation from English into Arabic using professional translators; independent back-translation to check for accuracy, consistency and equivalence; review by Turkish, Syrian and international mental health experts for cultural relevance, content, concept consistency, clarity and understanding; as well as piloting and field-testing to further refining the instrument. The survey was delivered face-to-face in a private room of a local refugee and asylum seeker organisation by enumerators who were fluent in Arabic. Staff received training prior to data collection and were paired with participants of the same gender. Informed consent was obtained from all participants and interviews lasted around 45 minutes. A gift card valued at 30 Turkish Lira (€6) was provided to compensate participants for their time. The study received ethical approval from committees at the London School of Hygiene & Tropical Medicine and Istanbul Şehir University.

Measures

The primary outcome of somatic distress was measured using the Patient Health Questionnaire (PHQ-15), a checklist of 15 somatic symptoms that collectively account for more than 90% of symptoms seen in primary care, excluding upper respiratory symptoms (28). Individuals were asked to report on a 3-point scale ranging from 0 (*not bothered at all*) to 2 (*bothered a lot*) how frequently each symptom caused them distress in the past two weeks. A total somatic symptom score was calculated, with possible scores ranging from 0 to 30, and scores scaled to account for the ~~one~~ additional question-item asked only of female

participants [relating to menstrual pain and problems](#). Two somatic distress outcome measures were calculated: 1) a dichotomised outcome variable ('high somatic distress' when three or more symptoms were endorsed as distressing, and 'low somatic distress' otherwise) (29), and 2) four categories of somatic symptom severity based on the PHQ-15 score ('minimal' (0-4), 'mild' (5-9), 'moderate' (10-14), or 'severe' (≥ 15)) (28).

Internal consistency of the PHQ-15 in our sample was measured using Cronbach's alpha and was shown to be good ($\alpha = .85$). The latent structure of the PHQ-15, described elsewhere (30), was tested using confirmatory factor analysis. Three correlated latent factors were found to have 'reasonable' to 'good' fit in our sample (root mean square error of approximation = .060 (90% CI: .055-.065); standardised root mean square residual = .039) (31): pain-fatigue symptoms ('back pain', 'pain in arms, legs or joints', 'headaches', 'feeling tired/low energy', 'trouble sleeping') ($\alpha = .72$), cardiopulmonary symptoms ('chest pain', 'dizziness', 'fainting spells', 'heart pounding or racing', 'shortness of breath') ($\alpha = .74$), and gastrointestinal symptoms ('stomach pain', 'constipation or diarrhoea', 'nausea, gas or indigestion') ($\alpha = .62$).

The Hopkins Symptom Checklist (HSCL-25) contains 10 items relating to depression and 15 to anxiety, which are assessed on a 4-point scale ranging from 1 (*not at all*) to 4 (*extremely*) (32). A mean score was calculated for the anxiety and depression items, and cut-off scores of ≥ 2.1 used for symptomatic depression and ≥ 2.0 for symptomatic anxiety based on a study which validated the instrument in another Arabic-speaking, conflict-affected population (33). Internal consistency was good for both the depression ($\alpha = .87$) and anxiety ($\alpha = .86$) subscales.

The PTSD Checklist for DSM-5 (PCL-5) asks respondents how often in the past two weeks they have been bothered by 20 symptoms, each on a 5-point scale ranging from 0 (*not at all*)

to 4 (*extremely*) (34). Responses were summed for all items and a cut-off score of ≥ 33 used to indicate symptoms of PTSD (35). The internal consistency of the PCL-5 in our sample was good ($\alpha = .87$).

The survey additionally captured information relating to participants' sociodemographic characteristics, the perceived needs of the community post-displacement, self-reported health, and lifetime history of mental health service utilisation. Items from the Humanitarian Emergency Settings Perceived Needs Scale (36) were used to measure the serious physical, social and psychological needs of the community. Participants were asked [to provide a binary response \('Yes' / 'No'\) regarding whether they were-if they were](#) living with a long-term illness, health problem, or disability which limits daily functioning, and whether they had ever witnessed or experienced a potentially traumatic event. A lifetime history of accessing mental health treatment was operationally defined as ever having been admitted for overnight stay in a health facility for mental health, emotions or nerves, or ever having had a session of psychological counselling or therapy with a professional.

Data analysis

Based on established cut-off scores for each instrument, descriptive statistics report the severity of somatic distress and prevalence of depression, anxiety and PTSD. Within each screening instrument, no score was calculated if a participant failed to answer at least two-thirds of items. ~~These records~~ (PHQ-15: $n = 19$; HSCL (anxiety): $n = 15$; HSCL (depression): $n = 18$; PCL-5: $n = 32$) ~~were~~. [Missing records were](#) included in the denominator when calculating proportions, but ~~excluded-complete case analysis was employed from during~~ regression [analysisanalyses](#). Chi-squared tests and independent t-tests were used to test the significance of proportions and mean scores respectively and Pearson correlation coefficients calculated to examine correlations between scales. Backward, stepwise logistic regression

analysis was conducted on both the dichotomised somatic distress outcome variable and the four categories of somatic distress severity to measure their bivariate and multivariate associations with sociodemographic characteristics, health service utilisation, perceived needs, experiencing a [potentially](#) traumatic event, and physical and mental health outcomes. [Variables not meeting our assumed Statistical-significance](#) ~~was assumed at~~ ($p < .05$) [were excluded from the model through a manual, stepwise approach](#) ~~and a~~. [Analysis was](#) conducted in Stata IC 14.0 (37).

Five items on the HSCL-25 ('faintness, dizziness or weakness', 'headaches' and 'heart pounding or racing', 'feeling low in energy' and 'difficulty falling asleep or staying asleep') and one item on the PCL-5 ('trouble falling or staying asleep') are also symptoms on the PHQ-15 ('dizziness', 'fainting spells', 'headaches', 'feeling your heart pound or race', 'feeling tired or having low energy', 'trouble sleeping'). Following methods described by van Ommeren and others (38), a sensitivity analysis was also conducted using adjusted HSCL-25 and PCL-5 scores in which these symptoms were removed in order to avoid endogeneity during regression analyses and the results are given in the Online Appendix.

Results

From the 2,865 names randomly selected from the Sultanbeyli municipal registry, 1,678 (58.6%) participants joined the study (Table 1). The median age of participants was 34 (range 18 – 88) and 51.6% were female. Participants overwhelmingly described their household economic situation as 'average' (51.8%) or 'bad' (43.7%). Forty-four percent of men were in regular employment and another 22.8% were either self-employed or casually employed, while 96.3% of women were not in formal employment. Participants reported a mean of 6.9 years of education and 8.2% of people had not completed any formal education. The mean period of displacement from Syria was 3.4 years and the period of time resident in

Sultanbeyli was 2.9 years. Thirty-six percent of respondents were currently experiencing symptoms of depression, 34.7% symptoms of anxiety, and 19.6% symptoms of PTSD. Thirty-seven percent of participants self-reported living with a long-term illness, health problem or disability which limited daily activities and 9.8% had a lifetime history of mental health treatment.

From our sample, 41.7% of people were experiencing high somatic distress (Table 2). A greater proportion of females experienced high somatic distress (51.2%) than males (31.7%, $\chi^2(1) = 66.25, p < .001$) and they reported more distressing somatic symptoms in the past two weeks (females: $M = 3.3, SD = 3.02$; males: $M = 2.1, SD = 2.38; t = -9.10, p < .001$), even after excluding the additional item asked only of females respondents (females: $M = 3.0, SD = 2.91; t = -7.33, p < .001$). The proportion of participants in high somatic distress was significantly higher in people with symptoms of each of the three common mental disorders than in those without: depression (69.8%, $\chi^2(1) = 304.76, p < .001$), anxiety (74.9%, $\chi^2(1) = 405.43, p < .001$), and PTSD (72.6%, $\chi^2(1) = 155.46, p < .001$). The mean number of symptoms reported as causing distress was significantly higher in people with depression (4.5, 95% CI [4.3-4.7]), anxiety (4.8, 95% CI [4.6-5.1]), and PTSD (4.9, 95% CI [4.6-5.2]), than it was in either people without symptoms of these three common mental disorders (1.4, 95% CI [1.2-1.5]) or those self-reporting living with a chronic condition or disability (4.0, 95% CI [3.7-4.2]).

The somatic symptoms most frequently reported as causing distress were pain in arms, legs or joints (38.4%, $n = 645$), back pain (38.0%, $n = 638$) and headaches (28.0%, $n = 470$) (Table 3). Pain-fatigue symptom scores showed strong, positive correlation (i.e. $> .5$) with all three common mental disorders: depression ($r = .63, p < 0.001$), anxiety ($r = .66, p < 0.001$), and PTSD ($r = .54, p < 0.001$), while cardiopulmonary symptom scores also showed strong positive correlations with depression ($r = .54, p < 0.001$) and anxiety ($r = .66, p < 0.001$).

These associations were maintained after adjustment for symptom overlap with corrected HSCL-25 and PCL-5 scores.

Multivariate ordered logistic regression, [based on a complete-case analysis of 1,383 participants following listwise deletion](#), measured the association between experiencing greater somatic symptom severity and being female ($OR = 2.91 [2.32-3.63]$, $p < .001$), living with a chronic disease or disability ($OR = 2.87 [2.28-3.61]$, $p < .001$), having a family member with mental health problems ($OR = 1.65 [1.30-2.09]$, $p < .001$) and experiencing symptoms of depression ($OR = 3.05 [2.32-4.01]$, $p < .001$), anxiety ($OR = 4.64 [3.50-6.15]$, $p < .001$) and PTSD ($OR = 1.75 [1.28-2.39]$, $p < .001$) (Table 4). Somatic symptom severity was negatively associated with living in a household in an ‘average’ ($OR = 0.64 [0.52-0.80]$, $p < .001$) or ‘good/very good’ ($OR = 0.53 [0.31-0.88]$, $p = .015$) economic situation, as well as having completed more years of education ($OR = 0.95 [0.93-0.98]$, $p = .001$).

A lifetime history of mental health treatment and post-displacement perceived needs (‘a lack of emotional support from others’, ‘inadequate law and justice in the community’, and ‘difficulties accessing adequate healthcare since arriving in Sultanbeyli’) were not associated with increased symptom severity, after controlling for other variables. Similarly, there was no significant association between increased somatic symptom severity and the number of years displaced from Syria (unadjusted $OR = 0.99 [0.93-1.05]$, $p = .652$) or number of years resident in Sultanbeyli (unadjusted $OR = 0.95 [0.88-1.02]$, $p = .13$).

Binomial logistic regression was also conducted to measure the variables associated with the dichotomised somatic distress categories. This showed similar patterns of association as the ordered regression, with the same dependent variables significantly associated with increased severity of somatic distress and to similar effect (Table 4). However, no significant association between experiencing symptoms of PTSD and the dichotomised outcome was

observed. Results of the sensitivity analysis using adjusted HSCL and PCL scores (Online Appendix) show the association between increased somatic distress and depression, anxiety and PTSD is maintained once the effect of symptom overlap is removed.

Discussion

To the best of our knowledge, this is the first study to report on somatic distress in Syrian refugees hosted in the Middle East. Our study reveals the substantial burden of somatic symptoms they experience and the strong association between these symptoms and common mental disorders. This contributes to the limited number of studies measuring somatic distress in conflict-affected populations living in low- and middle-income countries (21, 23-25, 39-41).

In our study, 43% of participants were experiencing moderate to severe somatic distress, which is higher than comparable research employing the PHQ-15 in conflict-affected, displaced populations. Studies of internally-displaced adults in Georgia and Ukraine have found the prevalence of moderate to severe somatic distress to be 18% and 31% respectively (23, 25) and a study of refugees hosted in Germany using a shortened version of the PHQ-15 reported a somatisation prevalence of 31% (42). Further, the mean PHQ-15 score in our sample (8.9 [95% CI: 8.6-9.2]) was higher than that observed in a study of Tunisians who were exposed to traumatic events during the protests and riots of the Arab Spring ($M = 7.2$, $SD = 5.3$, $N = 60$) (43).

The observed associations between both high levels of overall somatic distress and pain-fatigue symptoms with common mental disorders have been reported in studies of somatisation in refugees globally (44). Similarly, our findings align with the wider somatisation literature which report associations between increased somatic symptom

severity and self-reported chronic illness or disability, female gender, having completed fewer years of education, [traumatic experiences](#), and poor household economic circumstances (45, 46). Associations between somatisation and post-displacement stressors, in particular legal difficulties and limited information about friends and family at home, have been observed in refugee populations elsewhere (47); however these stressors were not statistically significant in our sample, after controlling for other variables.

Variation across studies in the prevalence of somatic distress and its associated factors likely reflects differences in both methodology and the underlying characteristics of the population, including [the types of their pre- and traumatic events experienced during displacement and conflict](#), [their post-migration experiences/circumstances](#), and selective migration and survival. Cultural idioms of distress and explanatory models of illness shape the manner in which distress is experienced and communicated, and how people make sense of their symptoms. Within a Syrian context, somatic symptoms such as stomach cramps, chest tightness, aches and pains, breathlessness and fatigue are commonly reported idioms of psychological distress and trauma (18, 48). Studies in other Arabic-speaking populations describe how these physical symptoms are more likely to be considered legitimate and worthy of attention, while emotional or psychological complaints are seen as weaknesses of personality or faith (49, 50). Further, the high levels of stigma and limited knowledge and awareness of mental health observed in Syrian refugees in Turkey (16) may increase the tendency for people to highlight physical, rather than psychological, symptoms (22).

In addition to the substantial individual suffering it causes, high levels of somatic distress likely impacts both household health expenditure and the local health systems. Qualitative research on Syrian refugees in Jordan found emotional distress to be the most frequently highlighted trigger for the incidence or exacerbation of non-communicable disease (51).

While Syrians registered for temporary protection have the right to free primary and

secondary health care in Turkey, language barriers and a limited understanding of the health system limit access to these services (52). Integrating evidence-based mental health interventions, such as cognitive behavioural therapy, into primary and community care could increase the recognition of psychological symptoms, reduce stigma, and improve the availability of services. Greater awareness amongst healthcare providers regarding the severity of somatic distress observed in this population, as well as the extent of symptom overlap with common mental disorders, is required. Transdiagnostic treatments, which are not focused on specific problems but instead address mental health problems broadly, should be offered. Improved health system responsiveness to the needs of refugees experiencing somatic distress could promote early detection, reduce treatment time and costs, and contribute to closing the substantial mental health treatment gap observed in this population (16).

Limitations

The results of our survey will have been affected by a non-response rate of 41%. Recruiting participants from a municipal register means that we will have missed Syrian refugees who have not registered for temporary protection, as well as those who registered elsewhere in Turkey and have since migrated to Istanbul. Further, our sampling strategy excluded non-Arabic speaking Syrian ethnic minorities. As a result, our sample may not be representative of the total Syrian population in Turkey. While the PHQ-15 has been shown to be a valid and reliable screening tool for somatic symptom severity in a variety of contexts, we are unable to assess all diagnostic criteria for somatic symptom disorders, in particular the requirement for disproportionate or excessive concern about symptoms, and the persistence of distress or disability for six months or more. Instead the patterns of somatic distress observed in our sample likely include the physical symptoms of both common mental disorders and underlying chronic physical conditions and injuries. These symptoms may reflect the

exacerbation of pre-existing chronic disease frequently observed in refugee populations due to treatment interruption, poor disease monitoring or increased risk factor exposure (53).

Finally, depression, anxiety and PTSD were not diagnosed using clinical interviews and instead relied on screening instruments used within a cross-sectional survey, which may lead to an overestimation of the prevalence of these common mental disorders (9). Longitudinal data collection and structured clinical interviews ~~could~~ would provide more robust estimates, as would further research to adapt and validate and allow the these survey instruments ~~to be validated~~ within the Syrian population through thorough translation, pilot interviewing and clinical calibration.

Conclusion

Our study reveals the high levels of somatic distress experienced by Syrian refugees living in Istanbul, in particular amongst women and those with symptoms of common mental disorders. In addition to its impact on individual suffering and daily functioning, this has implications for the local health system and highlights the importance of improving access to integrated, evidence-based interventions for the prevention and treatment of mental health disorders for Syrians in Turkey.

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Table 1: Demographic and health characteristics of the sample (N = 1,678)¹

	Male (n = 812)		Female (n = 866)		Total (n = 1,678)	
	n	%	n	%	n	%
Age group						
18-24	154	19.0	200	23.1	354	21.1
25-34	239	29.4	279	32.2	518	30.9
35-44	188	23.2	185	21.4	373	22.2
45-54	130	16.0	117	13.5	247	14.7
55+	100	12.3	82	9.5	182	10.8
Employment						
Regular employment	358	44.1	16	1.8	374	22.3
Irregular employment/self-employed	185	22.8	16	1.8	201	12.0
Unemployed	124	15.3	7	0.8	131	7.8
Not in formal employment ²	145	17.9	827	95.5	972	57.9
Household economic situation						
Good or very good	27	3.3	48	5.5	75	4.5
Average	402	49.5	465	53.7	867	51.7
Bad	379	46.7	352	40.6	731	43.6
Years of education (mean)	7.0		6.7		6.9	
Years displaced from Syria (mean)	3.5		3.3		3.4	
Symptoms of depression ³	262	32.3	344	39.7	606	36.1
Symptoms of anxiety ³	231	28.4	351	40.5	582	34.7
Symptoms of PTSD ⁴	143	17.6	185	21.4	328	19.6
History of mental health treatment ⁵	94	11.6	70	8.1	164	9.8
Chronic illness or disability	317	39.0	296	34.2	613	36.5

¹ [Some categories do not sum to the sample total due to non-response.](#)

² Includes housewives, students, volunteers, retired people, those on maternity leave, and others.

³ ‘Symptomatic depression’ defined using a cut-off score of ≥ 2.1 and ‘symptomatic anxiety’ using a cut-off score of ≥ 2.0 .

⁴ Calculated using a cut-off score of ≥ 33 .

⁵ Defined as ever having been admitted for overnight stay in hospital or health facility for help with emotions, nerves or mental health, or ever having had a session of psychological counselling or therapy.

Table 2: Level of somatic distress by probable mental disorder, (n, %)

	Total sample (n = 1,678)	Depression (n = 606)	Anxiety (n = 582)	PTSD (n = 328)	None of the 3 conditions (n = 877)
Somatic distress ¹					
High	700 (41.7)	423 (69.8)	436 (74.9)	238 (72.6)	178 (20.3)
Low	959 (57.2)	180 (29.7)	141 (24.2)	89 (27.1)	696 (79.4)
Somatic symptom severity ²					
Minimal	492 (29.3)	41 (6.8)	25 (4.3)	15 (4.6)	430 (49.0)
Mild	449 (26.8)	122 (20.1)	100 (17.2)	63 (19.2)	273 (31.1)
Moderate	381 (22.7)	180 (29.7)	185 (31.8)	95 (29.0)	132 (15.1)
Severe	337 (20.1)	260 (42.9)	267 (45.9)	154 (47.0)	39 (4.4)
Mean number of distressing symptoms [95% CI] ³	2.7 [2.6 - 2.8]	4.5 [4.3 - 4.7]	4.8 [4.6 - 5.1]	4.9 [4.6 - 5.2]	1.4 [1.2 - 1.5]
Mean PHQ15 score [95% CI]	8.9 [8.6 - 9.2]	13.3 [12.8 - 13.7]	14.0 [13.5 - 14.4]	13.9 [13.3 - 14.6]	5.5 [5.2 - 5.9]

¹ High somatic distress defined as reporting three or more PHQ-15 symptoms as causing distress.

² Severity categories based on PHQ-15 score: minimal (0-4), mild (5-9), moderate (10-14) & severe (≥15).

³ Mean number of somatic symptoms rated as '*bothered a lot*'.

Table 3: Somatic symptoms causing distress (n, %), by probable common mental disorder

PHQ-15 symptoms	Total sample (n = 1,678)	Depression (n = 606)	Anxiety (n = 582)	PTSD (n = 328)	None of the 3 conditions (n = 877)
Pain in arms, legs or joints	645 (38.4)	325 (53.6)	330 (56.7)	188 (57.3)	243 (27.7)
Back pain	638 (38.0)	332 (54.8)	334 (57.4)	194 (59.1)	223 (25.4)
Headaches	470 (28.0)	283 (46.7)	320 (55.0)	163 (49.7)	106 (12.1)
Feeling tired, having low energy	436 (26.0)	300 (49.5)	297 (51.0)	175 (53.4)	82 (9.4)
Menstrual cramps or problems ¹	224 (25.9)	116 (33.7)	118 (33.6)	64 (34.6)	75 (18.1)
Stomach pain	372 (22.2)	199 (32.8)	205 (35.2)	109 (33.2)	127 (14.5)
Trouble sleeping	303 (18.1)	240 (39.6)	219 (37.6)	150 (45.7)	38 (4.3)
Shortness of breath	246 (14.7)	170 (28.1)	178 (30.6)	111 (33.8)	47 (5.4)
Chest pain	225 (13.4)	142 (23.4)	144 (24.7)	82 (25.0)	53 (6.0)
Heart pounding or racing	225 (13.4)	159 (26.2)	172 (29.6)	106 (32.3)	35 (4.0)
Dizziness	219 (13.1)	160 (26.4)	168 (28.9)	92 (28.0)	36 (4.1)
Constipation or diarrhoea	216 (12.9)	114 (18.8)	123 (21.1)	64 (19.5)	63 (7.2)
Nausea, gas or indigestion	191 (11.4)	112 (18.5)	111 (19.1)	70 (21.3)	55 (6.3)
Pain or problems during sex	61 (3.6)	46 (7.6)	46 (7.9)	27 (8.2)	7 (0.8)
Fainting spells	36 (2.2)	27 (4.5)	30 (5.2)	13 (4.0)	3 (0.3)

¹ Percentages calculated for female participants only.

Table 4: Variables associated with increased somatic distress (*n* = 1,383)

	n (%)	Ordered logistic regression ¹				Binomial logistic regression ²			
		Unadjusted OR	[95% CI]	Adjusted OR	[95% CI]	Unadjusted OR	[95% CI]	Adjusted OR	[95% CI]
Female gender	866 (51.6)	2.18***	1.83-2.60	2.91***	2.32-3.63	2.28***	1.87-2.78	3.05***	2.27-4.09
Age									
18-24	354 (21.1)	1.00	...	1.00	...	1.00	...	1.00	...
25-34	518 (30.9)	1.51**	1.18-1.92	1.07	0.80-1.43	1.51**	1.13-2.01	1.09	0.74-1.63
35-44	373 (22.2)	2.27***	1.74-2.96	1.42*	1.03-1.95	2.29***	1.69-3.11	1.61*	1.05-2.47
45-54	247 (14.7)	2.45***	1.82-3.29	1.59*	1.11-2.29	2.41***	1.72-3.38	1.90**	1.18-3.06
55+	182 (10.8)	2.06***	1.49-2.86	1.39	0.92-2.11	2.10***	1.45-3.06	1.47	0.83-2.60
Years of education	...	0.95***	0.92-0.97	0.95**	0.93-0.98	0.93***	0.91-0.96	0.94**	0.90-0.97
Years displaced from Syria	...	0.99	0.93-1.05	...	...	0.97	0.91-1.04	...	...
Household economic situation									
Bad	731 (43.6)	1.00	...	1.00	...	1.00	...	1.00	...
Average	867 (51.7)	0.43***	0.36-0.52	0.64***	0.52-0.80	0.49***	0.40-0.61	0.76	0.57-1.01
Good or very good	75 (4.5)	0.27***	0.17-0.42	0.53*	0.31-0.88	0.23***	0.13-0.41	0.41*	0.19-0.89
Potentially traumatic life experience	768 (45.8)	1.78***	1.49-2.12	1.39**	1.11-1.74	1.65***	1.35-2.01	1.46*	1.09-1.96
Family member with mental illness	465 (27.7)	2.83***	2.33-3.45	1.65***	1.30-2.09	2.50***	2.01-3.12	1.49*	1.09-2.02
Would tell family about MH problems	1,294 (77.1)	0.67**	0.54-0.84	...	...	0.67**	0.52-0.85	...	...
History of MH treatment	164 (9.8)	2.64***	1.96-3.56	...	...	1.92***	1.38-2.66	...	...
Difficulties accessing healthcare	492 (29.3)	2.40***	1.98-2.91	...	...	2.39***	1.93-2.97	...	...
Living with a chronic condition	613 (36.5)	4.16***	3.44-5.02	2.87***	2.28-3.61	4.07***	3.29-5.03	3.37***	2.51-4.53
Symptoms of depression (HSCL-25)	606 (36.1)	8.73***	7.10-10.74	3.05***	2.32-4.01	6.66***	5.33-8.32	3.17***	2.30-4.37
Symptoms of anxiety (HSCL-25)	582 (34.7)	12.45***	10.00-15.49	4.64***	3.50-6.15	9.66***	7.63-12.22	4.19***	3.04-5.78
Symptoms of PTSD (PCL-5)	328 (19.6)	6.07***	4.80-7.66	1.75***	1.28-2.39	5.03***	3.85-6.58	...	...

¹. Outcome variable = somatic distress severity categories based on PHQ-15 score: minimal (0-4), low (5-9), moderate (10-14) and severe (≥ 15).

². Outcome variable = dichotomised high somatic distress (3 or more somatic symptoms) versus low somatic distress (fewer than 3 somatic symptoms).

* $p < .05$ ** $p < .01$ *** $p < .001$