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Research Article
Do Chronic Diseases and Availability of Medications Predict Post-traumatic Stress Disorder (PTSD) among Syrian Refugees in Jordan?

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Abstract

Objectives: The primary objective of this study was to examine if previous Chronic Diseases (CDs), newly diagnosed CDs in Jordan and medication shortages can predict PTSD in a cohort of Syrian refugees residing in Jordan. **Materials and Methods:** A cross-sectional study design was used. Approximately, 765 Syrian refugees were recruited from six different cities in Jordan. Data were collected using a demographical data sheet and a PTSD scale. Logistic regression was used to examine the impact of factors that showed significant association with the PTSD category. **Results:** Descriptive analysis of PTSD categories showed that the majority (81%) had lower PTSD scores. Moreover, PTSD was comorbid with chronic diseases in more than half of participants. Logistic regression analysis indicated that job status and availability of medications were predictors of PTSD. **Conclusion:** Job status and availability of medications were shown to be important factors that may influence PTSD among refugees. Further studies of additional factors and screening for mental health diseases for residing and coming refugees are recommended.

Key words: Syrian refugees, chronic diseases, availability of medications, post-traumatic stress disorder

Citation: Ahmed Mohammad Al-Smadi, Hanan Jameil Halaseh, Omar Salem Gammoh, Ala Fawzi Ashour, Besher Gharaibeh and Laurice Sami Khoury, 2016. Do chronic diseases and availability of medications predict post-traumatic stress disorder (PTSD) among Syrian refugees in Jordan? Pak. J. Nutr., 15: 936-941.

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

As a result of the Syrian crisis, nearly 1,410,520 Syrian refugees were registered with the United nations high commissioner for refugees in Jordan in December, 2014 and the majority of Syrian refugees reside in non-camp settings[1].

The high rate of refugees entering the country has exceeded the ability of the Jordanian government and the international community to ensure adequate access to health services and to provide proper medical care. Yet, the medical care provided prioritizes urgent care needs, focusing on emergency needs and the management of communicable diseases while, chronic diseases may be ignored[2,3].

Refugees arriving in the host country are at risk of psychiatric trauma and stress-related disorders precipitated by the refugee experience, infectious diseases and an increased susceptibility to chronic diseases including cancer, diabetes, hypertension, coronary heart disease and mental illness[4-9].

The PTSD is a mental health condition that is triggered by a terrifying event-either experiencing it or witnessing it. People who have PTSD may feel stressed or frightened even when they are no longer in danger. Symptoms may include flashbacks, nightmares and severe anxiety as well as uncontrollable thoughts about the event[10]. Controlling PTSD requires adequate psychological, psychosocial and pharmacological treatment[11-14].

The PTSD may cause physical health problems, particularly chronic diseases. Previous evidence supports the view that individuals with PTSD have the higher possibility of chronic diseases while, non-traumatized individuals are at the lowest risk[15].

The primary objective of this study was to examine if previous Chronic Diseases (CDs), newly diagnosed CDs in Jordan and medication shortages can predict PTSD in a cohort of Syrian refugees residing in Jordan. The secondary objective was to determine PTSD prevalence and comorbidity with CDs among Syrian refugees in Jordan. To this knowledge there is no published data related to PTSD prevalence, CDs and medication availability among Syrian refugees in Jordan.

MATERIALS AND METHODS

To meet the study objectives, a cross-sectional method was selected to explore the prevalence of PTSD and to examine the differences in PTSD scores based on participant's demographics including the presence or absence of chronic illness.

Study sample and settings: A convenient sample technique was selected to recruit study participants. Prior to conducting the study, sample size was calculated based on estimation of one million population size, 95% confidence level and 5% of confidence interval. The sample size calculations indicated the need for a minimum of 385 participants. However, the researcher decided to include 750 participants for the purpose of increasing generalizability of the results and to increase the number of participants to represent each geographical area of Syrian refugees living in Jordan.

The participants recruited represented six different cities, Mafraq, Madaba, Karak, Irbid, Amman and Karak. This represents most of the geographical areas of Syrian refugees living in Jordan. The inclusion criteria for participant selection required them to be adults aged 18 years and older and to be resident in Jordan as refugees for atleast the last 6 months. They also needed to be willing to take part in the study and to provide signed consent forms.

Data collection procedure: Data was collected by a trained psychologist and social worker and they received training in data collection from this researchers. Data collection was undertaken in Caritas heath centres during refugee's visits to these centres. The data collector contacted all refugees who reported to the centres, assessed their eligibility and willingness to participate in the study, explained the study aim, methods, procedure and gave out research informational sheets. For willing participants signed consent forms were obtained.

Demographical data sheets and questionnaires were distributed to participants for self-completing. However, illiterates were provided with help from the data collectors by reading and filling in their responses for the research package.

Study instruments: The current study is part of a larger study. Post-traumatic stress scale and demographics were measured. The Rhe PTSD was measured using the PTSD scale in Arabic[16]. The scale consists of 11 items in a three-point likert scale from zero 'rare' to 2 'always', with a total score ranging from 0-22. The developer set a score of 15 or above as higher PTSD. The current study examined the validity of the questionnaire by examining the Exploratory Factor Analysis (EFA). The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO-test) had a value of 0.7 indicating that the sample was adequate. Bartlett's test of sphericity was utilized to examine inter-correlation between items which was 0.03 and this indicates that there was no inter-correlation between items. Orthogonal rotation exploratory factor analysis was used, all

items were loaded in one factor with acceptable factor loading more than 0.40 and indicating the validity of the PTSD scale among the study sample.

Moreover, the PTSD scale reliability was assessed and shown to have acceptable reliability among Syrian refugees in Jordan with Cronbach's alpha of 0.84.

Data analysis: For the purpose of analysing the data, the SPSS version 21.0 was used. Demographics were analysed using descriptive and frequency analysis.

A Chi-square test was used to examine the association between PTSD category and demographical variables including chronic illness and medication availability. A logistic regression test was used to examine the impact of factors that showed significant association with PTSD category on the likelihood that recruited participants would have PTSD. All significant levels were set at less than 0.05.

Ethical considerations: Prior to conducting this study, ethical approval was obtained from the Caritas Jordan higher management. In addition, written informed consent and information sheets were provided for potential participants. Participants were informed that taking part in the study was voluntary and they had the right to withdraw from the study at any stage.

RESULTS

Sample characteristics: Eight hundred and eleven individuals were eligible and asked to take part in the study. Seven hundred and seventy three were willing to participate in the study with a response rate of 95.14%. However, some participants did not complete the study package and as a result 765 were included in the data analysis.

In Table 1 and 2, data were gained from six different cities in Jordan. Syrian refugees resident in Amman represented the highest number (n = 250, 32.7%) and Karak had the lowest number (n = 66, 8.6%). The majority of participants were younger than 50 years old (n = 658, 8.61%) and females (n = 425, 55.55%), resident in Jordan as refuges less than 1 year (n = 458, 59.86%), currently married (n = 656, 85.75%) had atleast school education (n = 668, 87.33%)

Table 1: Participant's living location with PTSD [a]association

Living location	Total No. (%)	No. of participants with lower PTSD (%)	No. of participants with higher PTSD (%)	χ^2 (p-value)
Amman	250 (32.8)	205 (26.8)	45 (5.900)	0.07
Madaba	97 (12.7)	83 (10.8)	14 (1.800)	
Irbid	112 (14.6)	82 (10.7)	30 (3.900)	
Karak	66 (8.6)	61 (7.9)	5 (0.065)	
Fhes	102 (13.3)	79 (10.3)	23 (3.000)	
Mafraq	138 (18.0)	114 (14.9)	24 (3.100)	

[a]As measured with the post-traumatic stress disorder scale[17]

Table 2: Demographics and study variables with PTSD[a] association

Factor (Total No.)	Categories	Total No. (%)	No. of participants with lower PTSD (%)	No. of participants with higher PTSD (%)	χ^2 (p-value)
Age	18-49 years	658 (86.01)	531 (69.41)	127 (16.60)	0.077
	50 years or more	107 (13.99)	93 (12.15)	14 (1.83)	
Gender	Male	340 (44.45)	287 (37.52)	53 (6.93)	0.042
	Female	425 (55.55)	337 (44.05)	88 (11.50)	
Residency in Jordan	Less than 1 year	458 (59.86)	365 (47.71)	93 (12.15)	0.061
	1 year or more	307 (40.14)	259 (33.85)	48 (6.27)	
Marital status	Single	109 (14.25)	92 (12.03)	17 (2.22)	0.248
	Married	656 (85.75)	532 (70.00)	124 (16.21)	
Education level	Illiterate	97 (12.67)	85 (11.11)	12 (15.68)	0.062
	School or higher	668 (87.33)	539 (70.45)	129 (16.86)	
Job	Yes	67 (8.75)	65 (8.49)	2 (0.20)	0.001
	No	698 (91.25)	559 (73.07)	139 (18.17)	
Enough income	Yes	114 (14.91)	93 (12.16)	21 (2.74)	0.558
	No	651 (85.09)	531 (69.41)	120 (15.68)	
Previous diagnosed chronic diseases (s)[b]	Yes	229 (30.25)	186 (24.57)	431 (56.94)	0.485
	No	528 (69.75)	431 (56.94)	97 (12.81)	
Chronic illness (s) developed in Jordan[b]	Yes	204 (27.79)	158 (21.52)	46 (6.27)	0.046
	No	530 (72.21)	441 (60.08)	89 (12.13)	
Medication availability	Yes	215 (28.10)	190 (24.83)	25 (3.27)	0.003
	No	550 (71.90)	434 (56.73)	116 (15.16)	

Syrian refugees in Jordan (n = 765), 2013-2014, [a]As measured with the post-traumatic stress disorder scale[17], [b]Some data were missing, analysis of previously diagnosed chronic diseases (s) was based on 757 participants and analysis of chronic illness (s) developed in Jordan was based on 734 participants

Table 3: Logistic regression predict likelihood of reporting PTSD among Syrian refugees in Jordan, 2013-2014

Variables	β	SE	Wald test	df	p-value[a]	Odds ratio	CI for odds ratio lower (95.0%)	CI for odds ratio upper (95.0%)
Gender	0.35	0.20	3.102	1	0.078	1.42	0.961	2.09
Having a Job	2.04	0.73	7.874	1	0.005	7.68	1.85	31.86
Diagnosed with chronic illness in Jordan	-0.38	0.21	3.280	1	0.070	0.69	0.46	1.03
Medication availability	0.71	0.253	7.980	1	0.005	2.04	1.24	3.35
Constant	-0.39	0.77	26.060	1	0.001	0.02		

β: Logistic coefficient, CI: Confidence interval, df: Degrees of freedom, SE: Standard error and [a]Significance set at p<0.05

reported insufficient income (n = 651, 85.09%) were not previously diagnosed with at least one chronic illness prior to arrival in Jordan (n = 528, 69.75%) were not diagnosed with atleast one chronic illness during their stay in Jordan as refugees (n = 530, 72.21%) and did not receive sufficient medications (n = 550, 71.9%).

PTSD scores and participant demographics: Descriptive analysis of PTSD categories among participants showed that the majority did not have higher PTSD scores 141 (18.43%) while, 624 (81.57%) had lower PTSD scores.

For the purpose of examining the differences between participant's demographics including chronic illness and availability of medications with PTSD categories (i.e., PTSD score of less than 15, 15 and above) analysis used a Chi-square test for independence. In Table 1 and 2, the results indicated non-significant differences in PTSD scores based on participant's place of residence, age, duration of residency in Jordan as refugees, marital status, level of education, sufficient income and previous chronic illness. However, the Chi-square test for independence shows that there were differences based on the gender of participants (p = 0.042), job status (p = 0.001), diagnosed with chronic illness during their stay as refugees in Jordan (p = 0.046) and medication availability status (p = 0.003).

In Table 3, logistic regression was performed to examine the impact of factors that showed significant differences with PTSD categories. The model consists of four independent variables, gender, job status and diagnosed with chronic illness during their stay as refugees in Jordan and medication availability status.

On the whole, the model explained 4.1% (Cox and Snell R-squared) and 6.7% (Nagelkerke R-squared) of the variance in PTSD status and correctly classified 81.6% of cases. However, the analysis indicated that only two variables made a significant contribution to the model-job status and availability of medications. Job status was shown to be the strongest predictor of PTSD with an odds ratio of 7.67 which indicated that for one increase in job status respondents were 7.67 times less likely to report PTSD, controlling other variables

in the model. The odds ratio of 2.04 for medication availability indicated that for one increase in medication availability respondents were 2.04 times less likely to report PTSD, controlling other variables in the model.

DISCUSSION

Although, this study showed that there were significant differences in PTSD based on refugee's diagnosis of chronic illness during their stay as refugee's and availability of medications however, only job status and availability of medications were predictors of PTSD. In addition, the results of the current study showed that around one in five refugees had higher PTSD scores. Moreover, PTSD scores were high in 56.94% with previous chronic illness.

As there is no previous study that examines the prediction of chronic diseases and the risk of PTSD among Syrian refugees in Jordan, the results of the current study were compared with those for other refugees worldwide.

The PTSD rate in this study is consistent with previous studies[17]. Conversely, other studies reported higher PTSD rates for instance, PTSD prevalence reached almost 50% among Albanian refugees living in the United kingdom[18]. More important is the fact that trauma is considered an important predictor for mental health status even after years of trauma exposure[19].

The PTSD was comorbid with chronic diseases in more than half of the participants. The cross-talk between mental diseases and chronic "physical" diseases is evident. In the Netherlands, asylum seekers with PTSD had a higher prevalence of type two diabetes mellitus compared with those without PTSD[20]. Although, still unclearly understood, trauma induces neuroendocrine impairments that in turn activate mechanisms contributing to the development of systemic diseases[21]. Furthermore, contributing factors could include a lack of sustainable medical care and low education level[22]. In the current study, chronic illness was associated with the presence of PTSD however, chronic diseases did not predict PTSD. Similarly, chronic diseases were associated with

depression but did not predict it[22]. A possible explanation is that the PTSD data collection method was a self-completing test and this could lead to a lack of accuracy. Also, PTSD could be explained by other contributory factors such as experienced trauma, financial loss, poor living conditions and others.

Lack of medications and jobs predicted PTSD in this study. The PTSD is associated with fear[23]. The researchers suggest that due to a lack of knowledge refugees are not afraid of becoming sick however, they are afraid if they don't have medications. In other words, chronic diseases such as hypertension and diabetes are "silent diseases". Therefore, it is assumed that chronic diseases are not perceived by the subjects as a threatening condition whereas, the idea of not obtaining medications can predispose additional fear especially that the refugee communities has high medication consumption[24]. This feeling of fear or threat could predict PTSD.

Similarly, lack of jobs represents a stressful condition that predicts PTSD. It is well documented that mental disorders in refugees and war survivors are mainly attributed with loss of status and financial loss[21].

The current study had several strengths such as sample size and recruitment from different cities that led to the collection of a representative sample. Conversely, the study had some limitations. The study questionnaire was self-reporting and this may lead to inaccurate data collection in some participants. Also, chronic diseases and lack of medications were not specified by type.

The international community must step up efforts to support Syrian refugees and their host governments. In general, mental health status is often over-looked for physical health. The researchers recommend screening for mental health diseases for residing and coming refugees.

Moreover, patient education campaigns by health care providers such as nurses, pharmacists and physicians are mandatory to reduce the spread and intensity of chronic diseases that in turn places a huge burden on host countries and the international society.

ACKNOWLEDGMENT

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