Electronic Journal of General Medicine
2023, 20(4), em485
e-ISSN: 2516-3507
https://www.ejgm.co.uk/

MODESTUM

Original Article

OPEN ACCESS

Post-traumatic stress disorder burden among female Syrian war refugees is associated with dysmenorrhea severity but not with the analgesics

Omar Gammoh [1]*, Hannah Durand [2], Hanan Abu-Shaikh [3], Mervat Alsous [1]

[1] Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, Yarmouk University, Irbid, JORDAN
[2] Division of Psychology, Faculty of Natural Sciences, University of Stirling, Stirling, SCOTLAND
[3] Prince Hamza Hospital, Amman, JORDAN
***Corresponding Author:** omar.gammoh@yu.edu.jo

Citation: Gammoh O, Durand H, Abu-Shaikh H, Alsous M. Post-traumatic stress disorder burden among female Syrian war refugees is associated with dysmenorrhea severity but not with the analgesics. Electron J Gen Med. 2023;20(4):em485. https://doi.org/10.29333/ejgm/13089

ARTICLE INFO

Received: 07 Feb. 2023

Accepted: 12 Mar. 2023

ABSTRACT

Dysmenorrhea association with post-traumatic stress disorder (PTSD) has not been studied in refugees. We aimed to examine the associations between dysmenorrhea severity, dysmenorrhea analgesics self-medications, and PTSD in a cohort of Syrian war refugees residing in Jordan.

This is a cross-sectional study based on predetermined inclusion criteria held at Caritas primary care centers in Jordanian districts between September and October 2022. The participants' demographics and analgesic self-medication type were recorded through a structured questionnaire. The dysmenorrhea severity was measured by (working ability, location, intensity, days of pain, and dysmenorrhea) WaLiDD scale, PTSD was measured by Davidson trauma scale (DTS)-DSM-IV.

Data from 347 Syrian female war refugees were analyzed. The multivariate analysis showed that dysmenorrhea severity demonstrated significantly higher estimates for PTSD (10.48 [6.72-14.23], p=0.001), however, the analgesic type was not associated with PTSD burden.

In conclusion, dysmenorrhea severity, but not self-medication, was associated with a higher PTSD burden.

Keywords: PTSD, dysmenorrhea, women, refugees, analgesics

INTRODUCTION

Post-traumatic stress disorder (PTSD) is a psychiatric disorder that can develop following exposure to a traumatic event [1]. While most people who experience trauma may have difficulty adjusting in the short term, individuals with PTSD will experience severe long-term symptoms that interfere with daily functioning. PTSD is typically characterized by a combination of intrusive memories, avoidance, negative changes in thinking and mood, and changes in physical and emotional reactions. People with PTSD may be at greater risk of developing physical health problems [2], through engagement with risky and health-compromising coping behaviors [3] and/or the detrimental effects of prolonged hyperarousal and stress on the body [4].

War displacement is a major contributor to PTSD worldwide [5-7]. Relative to single traumatic events limited to one point in time, the management of PTSD due to war displacement is highly challenging due to ongoing post-migration stressors including socioeconomic impacts and concomitant mental and physical health issues [8-10]. Displaced people may struggle to access adequate healthcare [11], which can have long-term negative consequences for the management of war-induced mental and physical health problems.

Sex and gender differences in PTSD are well-established yet poorly understood, largely due to limitations in gender- and sex-sensitive research and reporting [12]. Women are more vulnerable to developing PTSD compared to men [7, 13]; women are at two-fold higher risk of developing PTSD after exposure to traumatic events [14] and may be more likely to develop chronic forms of PTSD [15]. Both psychosocial and biological explanations for these sex and gender differences have been suggested, with much of the research to date focusing on trauma type [14], pre-traumatic, peritraumatic, and post-traumatic risk factors [16].

This literature suggests women are particularly vulnerable to the psychological consequences of war [17]. Many aspects of war disproportionately affect women and their health. Social upheaval and societal changes in the wake of war may subordinate women and deprioritize their health, as well as render them more likely to experience violent acts such as rape and sexual assault [18]. Sociocultural norms of collectivist societies may also affect women's coping responses in the wake of traumatic events, leading to further deleterious effects on their health and wellbeing [19]. At an individual level, women tend to score higher on acute subjective responses

such as threat perception and peritraumatic dissociation, which are known predictors of PTSD [12]. Women also tend towards emotion-focused, defensive, and palliative coping strategies, which have been associated with heightened risk for PTSD [20].

Co-occurrence of PTSD and pain is common, and each is likely to interact with the other to negatively impact outcomes and treatment of either condition [19]. Women with PTSD following exposure to violent conflict are prone to painful physical health problems [7, 21-23] particularly issues of the musculoskeletal and reproductive systems [11]. Though there is little published data, one study has identified associations between dysmenorrhea (i.e., menstrual pain) severity and PTSD symptoms nine months after a traumatic event [13]. Moreover, women with PTSD are two times more likely to experience dysmenorrhea compared to untraumatized peers [24]. In addition, women experiencing high daily stress are at higher risk of dysmenorrhea [25]. One possible explanation is that PTSD and dysmenorrhea may both be associated with increased inflammation manifested by higher cytokines and prostaglandins [26, 27]. Given both PTSD and dysmenorrhea can have harmful effects on functionality, health, and quality of life, this relationship warrants further exploration.

Self-medication, defined as the use of medication without consultation with a medical practitioner [28] , is among the most common pain management strategies for dysmenorrhea worldwide [29]. As well as over the counter medications, herbal remedies such as ginger and fennel are used. Though self-medication is common and can provide an inexpensive, rapid, and convenient solution, risks include improper dosage, inappropriate choice of therapy, masking of severe disease, and adverse drug interactions [30]. Understanding self-medication practices among refugee women experiencing PTSD and dysmenorrhea is essential to ensure culturally safe medical practice and promote optimal health [31]. However, to date, no research has explored the association between dysmenorrhea severity, self-medication, and PTSD burden among Syrian refugees. The aim of the current study, therefore, is to examine whether dysmenorrhea severity and analgesics use could be associated with PTSD in a sample of Syrian refugees displaced to Jordanian urban districts.

MATERIALS AND METHODS

Study Design and Settings

This is a cross-sectional cohort study approved by Yarmouk University. After obtaining the data set for female Syrian refugees, a female research assistant approached the participants via phone calls to explain the study objective and methods. Afterward, the study link was sent to the interested females where the first step was to read and sign the consent form electronically and then to enroll in the study voluntarily. All participants had the right to withdraw from the study at any time. The research assistant assisted illiterate participants by reading out the study questionnaire over the phone. The inclusion criteria were Syrian female refugees, displaced for not less than five years, residing in urban districts (i.e., outside the refugee camps) aged between 18 and 40 years, not reporting menopause, with no history of hysterectomy or radiation and using self-medication for dysmenorrhea of either over the counter analgesic or herbs.

Study Instrument

Covariates

A self-administered structured online questionnaire was employed to cover the participants' demographical and clinical data including age, body mass index, employment, marital status, the number of years of displacement, current residence location, the presence of chronic diseases, the use of chronic medications and the severity of dysmenorrhea. In order to evaluate the severity of dysmenorrhea, the WaLIDD (working ability, location, intensity, days of pain, dysmenorrhea) self-report scale was used [32]. The WaLIDD scale comprises four subscales that measure features of dysmenorrhea, specifically:

(1) number of anatomical pain locations (no part of the body, lower abdomen, lumbar region, lower limbs, and inguinal region),

(2) pain range (does not hurt, hurts a little, hurts a little more, hurts even more, hurts a lot, and hurts a lot more),

(3) number of days of pain during menstruation (0, 1-2 days, 3-4 days, and >5 days), and

(4) frequency of disabling pain impacting ability to perform their activities (never, almost never, almost always, and always).

Each subscale provided a specific score between 0 and 3, and the total score ranged from 0 to 12 points. The score interpretations are, as follows: 0 without dysmenorrhea, 1-4 mild dysmenorrhea, 5-7 moderate dysmenorrhea, 8-12 severe dysmenorrhea.

Exposure

In order to record the exact medications used by the participants, all the over-the-counter analgesics and other self-medications options were included as a checklist embedded within the study instrument. To ensure the accuracy of data collection, both the generic and brand names, as well as a picture of the medication pack, were presented to the participants. The medication list included the three following therapeutics: paracetamol, non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, diclofenac, and naproxen, and a variety of herbal remedies such as fennel and anise preparations. Furthermore, the participants were asked to determine the dosing frequency of the analgesics during dysmenorrhea as follows: more than one dose per day, only one dose per day, on intermitted days, and almost nil.

PTSD measurement

PTSD was measured using a validated Arabic version of the Davidson trauma scale (DTS)-DSM-IV [33], as used in [34]. The DTS is a 17-item self-report measure that assesses the 17 DSM-IV symptoms of PTSD. Items are rated on 5-point frequency (0="not at all" to 4="every day") and severity scales (0="not at all distressing" to 4="extremely distressing"). Scores range from 0 to 68, with higher scores indicating higher PTSD symptoms.

Statistical Analysis

Descriptive statistics were used including frequencies and percentages and Chi-square test. A multivariable linear regression model was used to study the association between the exposure and the outcome variable. To select the variables

Table 1. Participants' variables according to the analgesics used

Factor	Category	Acetaminophen [n (%)]	p	NSAIDs [n (%)]	p	Herbs [n (%)]	p
Age	Below 26	92 (44.7)	0.320	30 (42.9)	0.490	46 (49.9)	0.240
	26 & above	114 (55.3)		40 (57.1)		52 (53.1)	
Marital status	Single	39 (18.9)	0.260	13 (18.6)	0.480	20 (20.4)	0.240
	Married	167 (81.2)		57 (81.4)		78 (79.6)	
Employed	Unemployed	184(89.3)	0.080	67 (95.7)	0.090	92 (93.9)	0.180
	Employed	22 (10.7)		3 (4.3)		6 (6.1)	
Location	Amman	101 (49.0)	0.820	36 (51.4)	0.340	39 (39.8)	0.030*
	North district	105 (51.0)		34 (48.6)		59 (60.2)	
Years of displacement	5-9 years	126 (61.2)	0.310	38 (54.3)	0.180	60 (61.2)	0.420
	10 & more	80 (38.8)		32 (45.7)		38 (38.8)	
Chronic diseases	No	153 (74.6)	0.370	50 (71.4)	0.240	74 (76.3)	0.470
	Yes	52 (25.4)		20 (28.6)		23 (23.7)	
Chronic medications	No	133 (64.9)	0.240	44 (62.9)	0.290	65 (67.0)	0.510
	Yes	72 (35.1)		26 (37.1)		32 (33.0)	
BMI	Below 25	89 (43.2)	0.090	24 (34.3)	0.010*	51 (52.0)	0.100
	25 & above	117 (56.8)		46 (65.7)		47 (48.0)	
Analgesic dosing frequency	Almost nil	41 (19.9)	0.001*	3 (4.3)	0.001*	15 (15.3)	0.004*
	Every other day	55 (26.7)		16 (22.9)		27 (27.6)	
	Once daily	65 (31.6)		25 (35.7)		33 (33.7)	
	More than one dose per day	45 (21.8)		26 (37.1)		23 (23.5)	

Note. Data was analyzed using Chi-square test; *p<0.05. NSAIDs: Non-steroidal anti-inflammatory drugs; & BMI: Body mass index

for the models, we assessed the association between each variable and the outcome using univariate linear regression. Candidate variables below the cut-off value of p<0.10 were included. Afterward, multivariable linear regression was carried out including variables meeting the significance level in the univariate analysis to identify independent associations between the exposure and outcome variables. Statistical significance was set at 2-sided p<.05 and estimates were set at 95% CI.

RESULTS

Response Rate

Out of the 447 eligible females approached, 53 declined to participate. A further 13 were excluded because they did not meet the inclusion criteria. An additional 27 were excluded due to incomplete data, and seven were excluded due to technical barriers (e.g., unavailability of smart phone and technological illiteracy). Therefore, a total of 347 participants were included for analysis with an overall response rate of 77.6%.

Characteristics of the Participants

Of the 347 participants, 202 (58.2%) were above 25 years, 186 (53.6%) had a body mass index above 25, 284 (81.8%) were married, 313 (90.2%) were unemployed, 206 (59.9%) were displaced for a period of 5-10 years, 87 (25.1%) reported chronic diseases, and 114 (32.9%) reported using chronic medications. A total of 206 (59.4%) reported using paracetamol, 70 (20.2%) reported using non-steroidal anti-inflammatory drugs and 98 (28.2%) reported using herbs. The participants' variables according to the analgesics used are shown in **Table 1**.

Table 2 shows the univariate association between the patient features and PTSD. Dysmenorrhea severity was associated with higher estimates for PTSD (11.67 (7.82-15.50), p<0.001), the use of herbs was associated with higher estimates for PTSD (4.61 (0.26-8.97), p=0.03), higher analgesic dosing frequency (2.81 (1.02-4.54), p=0.002), chronic diseases (6.38(1.82-10.95), p=0.006) and use of chronic medications (3.61 (-0.61-7.82), p=0.09).

Multivariate Analysis

Table 2 shows the multivariate regression models. The multivariate regression model for PTSD included marital status, presence of chronic diseases and dysmenorrhea severity. PTSD burden was positively associated with dysmenorrhea severity and the presence of chronic diseases. Dysmenorrhea severity demonstrated significant higher estimates for PTSD (10.48 [6.7214.23], p<0.001), chronic diseases demonstrated significant higher odds for PTSD (5.29 [1.01-9.56], p= 0.01).

DISCUSSIONS

The current study aimed to examine the association between dysmenorrhea severity, self-medication and PTSD burden among female Syrian war refugees. Our findings indicate that the severity of dysmenorrhea, but not the use of analgesics, was associated with higher PTSD burden in this sample.

The current findings make an important incremental contribution to the study of women's health in the context of PTSD and war displacement. Similar findings have been demonstrated in female war veterans of conflict in Iraq and Afghanistan [24]. Women with PTSD were over 2.5 times more likely to receive a diagnosis of dysmenorrhea than peers without mental health disorders. Our study extends this literature by focusing on refugee women displaced by conflict in Syria. Given that modern warfare increasingly targets civilian populations, rendering those living in conflict-affected areas at high risk of adverse mental and physical health impacts, further research and policy changes are needed to protect the health and wellbeing of the most vulnerable victims of conflict.

In the present study, occasional use of paracetamol and NSAIDs was not associated with an increased PTSD burden. Both paracetamol and NSAIDs have demonstrated mood enhancing effects in previous studies [35, 36]. The suggested

Table 2. Association between demographics, analgesics, & PTSD

Factor	Category	n (%)	Univariate analysis			Multivariate analysis		
			β	95% CI	p	β	95% CI	p
Age	Below 26	145 (41.8)	1.15	-2.88-5.18	0.570			
	26 & above	202 (58.2)						
BMI	Below 25	161 (46.4)	0.41	-3.59-4.47	0.840			
	25 & above	186 (53.6)						
Marital status	Single	60 (17.3)	-11.00	-16.12-5.88	0.001*	-10.16	-15.0--5.32	0.001*
	Married	284 (53.6)						
Employment	Unemployed	313 (90.2)	-0.24	-7.31-6.80	0.940			
	Employed	31 (8.9)						
Location	Amman	168 (48.4)	1.02	-2.98-5.05	0.620			
	North	176 (50.7)						
Years of displacement	5-9 years	206 (59.4)	3.37	-0.72-7.43	0.150			
	10 & more	138 (39.8)						
Chronic diseases	No	254 (73.2)	6.38	1.82-10.95	0.006*	5.29	1.01-9.56	0.010*
	Yes	87 (25.1)						
Chronic medications	No	227 (65.4)	3.61	-0.61-7.82	0.090			
	Yes	114 (32.9)						
Dysmenorrhea severity	Mild to moderate	193 (55.6)	11.67	7.82-15.50	0.001*	10.48	6.72-14.23	0.001*
	Severe	154 (44.4)						
Paracetamol	Yes	206 (59.4)	0.28	-3.86-4.42	0.890			
NSAIDs	Yes	70 (20.2)	2.74	-2.15-7.63	0.270			
Herbs	Yes	98 (28.2)	4.61	0.26-8.97	0.030*			
Analgesic dosing frequency	Almost nil	98 (28.2)	2.81	1.02-4.54	0.002			
	Every other day	79 (22.8)						
	Once daily	89 (25.6)						
	More than one dose per day	65 (18.7)						

Note. A univariate linear regression analysis was performed first, potential factors were then included in multivariate linear regression model; Marital status, chronic diseases, & dysmenorrhea severity were finally included in multivariate linear regression; PTSD was measured using Davidson trauma scale (DTS)-DSM-IV; NSAIDs: Non-steroidal anti-inflammatory drugs; BMI: Body mass index; uOR: Univariate odd ratio; aOR: Adjusted odd ratio; & *p<0.05

antidepressant effect for paracetamol and NSAIDs comes from inhibiting cyclooxygenase (COX) enzymes, mainly COX-2 [37-40]. Participants who did not report using either paracetamol or NSAIDs (i.e., those who reported using herbal medicine only) were at higher odds for PTSD according to the univariate analysis (**Table 2**).

Our findings demonstrated a significant association between the presence of chronic diseases and dysmenorrhea severity. This finding is consistent with previous studies [41], where PTSD was comorbid with chronic diseases. This can be explained by the fact that chronic diseases and their long term management represent a continuous stressing factor for this vulnerable group [8].

To our knowledge, this is the first study to examine the association between dysmenorrhea and PTSD in a sample of war refugees. This novelty is one of the study's core strengths. In addition, the study is strengthened by the use of well-validated tools to measure the key variables, as well as the large sample size and high response rate. However, there are certain limitations that must be considered. The cross-sectional design did not allow for long term follow-up, which limits the assertions we can make based on these findings. The study did not focus on other related mental disorders such as depression and anxiety, symptoms of which have been associated with both PTSD and dysmenorrhea. While the narrow focus of this study limited the response burden on participants, future research may benefit from including additional variables that may go further in explaining the relationship between PTSD and dysmenorrhea.

This cross-sectional study makes an incremental contribution to the literature on PTSD and women's health. Inflammation appears to play a key role in both PTSD and dysmenorrhea[27, 42], which may explain the relationship between them; however, the exact nature of this relationship remains unclear. Are women with PTSD more likely to experience more severe dysmenorrhea, or are those with heightened sensitivity to menstrual pain more vulnerable to the psychological effects of trauma? Longitudinal research and research designs better equipped to test potential causal relationships may further elucidate this.

This research has clear implications for clinical practice. We studied a group of participants engaged in self-medication of dysmenorrhea. While self-medication is often an appropriate and accessible means of pain management for dysmenorrhea, lack of engagement with healthcare professionals about menstrual pain experiences can result in inadequate pain management and delayed identification of potential underlying pathologies such as endometriosis, fibroids, or infection. Gynecological pain should be considered a post-migration treatment target to promote health and wellbeing among refugees. Refugee women may face unique challenges to accessing gynecological healthcare, including societal perceptions that menstrual pain is normal and must be tolerated. Menstrual health literacy programs targeting displaced refugee women as well as specialist gynecological healthcare clinics in affected areas may help improve health outcomes for these women.

CONCLUSIONS

In conclusion, dysmenorrhea severity, but not self-medication, was associated with higher PTSD burden among Syrian war refugees. Future research to better understand the

nature of this relationship is warranted to inform mental and gynecological healthcare practices for refugee women. Menstrual health campaigns targeting refugee women may improve menstrual health literacy, promote appropriate help-seeking behavior, and improve functionality in the face of menstrual pain. Mental healthcare for refugee women with PTSD should be sex- and gender-sensitive to promote optimal outcomes for this vulnerable group.

Author contributions: All authors have sufficiently contributed to the study and agreed with the results and conclusions.

Funding: This study was funded by Yarmouk University.

Acknowledgments: The authors would like to thank Caritas workers for their support, Nour, Yasmina, and Suzi.

Ethical statement: Authors stated that the study was approved by the Institutional Review Board of Yarmouk University IRB number (39/2022), and a Non-Disclosure Agreement was signed with Caritas (a Catholic Non-Governmental Organization) to access the database of female Syrian war refugees attending the medical, social, and psychological services in urban areas of Jordan.

Declaration of interest: No conflict of interest is declared by authors.

Data sharing statement: Data supporting the findings and conclusions are available upon request from the corresponding author.

REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5-TR). Washington, DC: American Psychiatric Association; 2013. https://doi.org/10.1176/appi.books.9780890425596
2. Qureshi SU, Pyne JM, Magruder KM, Schulz PE, Kunik ME. The link between post-traumatic stress disorder and physical comorbidities: A systematic review. Psychiatr Q. 2009;80(2):87-97. https://doi.org/10.1007/s11126-009-9096-4 PMid:19291401
3. Gilpin NW, Weiner JL. Neurobiology of comorbid post-traumatic stress disorder and alcohol-use disorder. Genes Brain Behav. 2017;16(1):15-43. https://doi.org/10.1111/gbb.12349 PMid:27749004 PMCid:PMC5477640
4. Yaribeygi H, Panahi Y, Sahraei H, Johnston TP, Sahebkar A. The impact of stress on body function: A review. EXCLI J. 2017;16:1057-72.
5. Shin G, Lee SJ. Mental health and PTSD in female North Korean refugees. Health Care Women Int. 2015;36(4):409-23. https://doi.org/10.1080/07399332.2013.817412 PMid:24020655
6. Kim E, Yun M, Jun JY, Park W-S. Pre-migration trauma, repatriation experiences, and PTSD among North Korean refugees. J Immigr Minor Health. 2019;21(3):466-72. https://doi.org/10.1007/s10903-018-0742-5 PMid:29651589
7. Al-Smadi AM, Tawalbeh LI, Gammoh OS, Ashour AF, Shajrawi A, Attarian H. Relationship between anxiety, post-traumatic stress, insomnia and fibromyalgia among female refugees in jordan: A cross-sectional study. J Psychiatr Ment Health Nurs. 2021;28(4):738-47. https://doi.org/10.1111/jpm.12732 PMid:33448096
8. Gammouh OS, Al-Smadi AM, Tawalbeh LI, Khoury LS. Chronic diseases, lack of medications, and depression among Syrian refugees in Jordan, 2013-2014. Prev Chronic Dis. 2015;12:E10. https://doi.org/10.5888/pcd12.140424 PMid:25633485 PMCid:PMC4310712
9. Regehr C, Carey M, Wagner S, et al. Prevalence of PTSD, depression and anxiety disorders in correctional officers: A systematic review. Corrections. 2021;6(3):229-41. https://doi.org/10.1080/23774657.2019.1641765
10. Jamil H, Nassar-McMillan SC, Salman WA, Tahar M, Jamil L. Iraqi Gulf War veteran refugees in the U.S.: PTSD and physical symptoms. Soc Work Health Care. 2006;43(4):85-98. https://doi.org/10.1300/J010v43n04_06 PMid:16966311
11. Arcel LT, Popovic S, Kucukalic A, Bravo-Mehmedbasic A. Treatment of torture and trauma survivors in a post-war society. Sarajevo: Association for Rehabilitation of Torture Victims–Center for Torture Victims; 2003.
12. Olff M. Sex and gender differences in post-traumatic stress disorder: An update. Eur J Psychotraumatol. 2017;8(sup4):1351204. https://doi.org/10.1080/20008198.2017.1351204 PMCid:PMC5632782
13. Takeda T, Tadakawa M, Koga S, Nagase S, Yaegashi N. Relationship between dysmenorrhea and posttraumatic stress disorder in Japanese high school students 9 months after the Great East Japan Earthquake. J Pediatr Adolesc Gynecol. 2013;26(6):355-7. https://doi.org/10.1016/j.jpag.2013.06.020 PMid:24075088
14. Tolin DF, Foa EB. Sex differences in trauma and posttraumatic stress disorder: A quantitative review of 25 years of research. Psychol Bull. 2008;132(6):959-92. https://doi.org/10.1037/0033-2909.132.6.959 PMid:17073529
15. Breslau N. Gender differences in trauma and posttraumatic stress disorder. J Gend Specif Med. 2002;5(1):34-40.
16. Christiansen DM, Hansen M. Accounting for sex differences in PTSD: A multi-variable mediation model. Eur J Psychotraumatol. 2015;6:26068. https://doi.org/10.3402/ejpt.v6.26068 PMid:25604705 PMCid:PMC4300366
17. Murthy RS, Lakshminarayana R. Mental health consequences of war: A brief review of research findings. World Psychiatry. 2006;5(1):25-30.
18. Arcel LT, Kastrup MC. War, women and health. NORA-Nordic J Fem Gend Res. 2004;12(1):40-7. https://doi.org/10.1080/08038740410005758
19. Kizilhan JI. Trauma and pain in family-orientated societies. Int J Environ Res Public Health. 2018;15(1):44. https://doi.org/10.3390/ijerph15010044 PMid:29283370 PMCid:PMC5800143
20. Karstoft K-I, Armour C, Elklit A, Solomon Z. The role of locus of control and coping style in predicting longitudinal PTSD-trajectories after combat exposure. J Anxiety Disord. 2015;32:89-94. https://doi.org/10.1016/j.janxdis.2015.03.007 PMid:25890288
21. Gammoh OS, Al-Smadi A, Tayfur M, et al. Syrian female war refugees: Preliminary fibromyalgia and insomnia screening and treatment trends. Int J Psychiatry Clin Pract. 2020;24(4):387-91. https://doi.org/10.1080/13651501.2020.1776329 PMid:32657625
22. Rometsch C, Denkinger JK, Engelhardt M, et al. Pain, somatic complaints, and subjective concepts of illness in traumatized female refugees who experienced extreme violence by the “Islamic State”(IS). J Psychosom Res. 2020;130:109931. https://doi.org/10.1016/j.jpsychores.2020.109931 PMid:31981895
23. El Sount CR-O, Windthorst P, Denkinger J, et al. Chronic pain in refugees with posttraumatic stress disorder (PTSD): A systematic review on patients’ characteristics and specific interventions. J Psychosom Res. 2019;118:83-97. https://doi.org/10.1016/j.jpsychores.2018.07.014 PMid:30078503

24. Cohen BE, Maguen S, Bertenthal D, Shi Y, Jacoby V, Seal KH. Reproductive and other health outcomes in Iraq and Afghanistan women veterans using VA health care: Association with mental health diagnoses. Women's Heal Issues. 2012;22(5):e461-71. https://doi.org/10.1016/j.whi.2012.06.005 PMid:22944901 PMCid:PMC4631402
25. Bajalan Z, Moafi F, MoradiBaglooei M, Alimoradi Z. Mental health and primary dysmenorrhea: A systematic review. J Psychosom Obstet Gynecol. 2019;40(3):185-94. https://doi.org/10.1080/0167482X.2018.1470619 PMid:29745745
26. Szarka A, Rigo JJ, Lazar L, Beko G, Molvarec A. Circulating cytokines, chemokines and adhesion molecules in normal pregnancy and preeclampsia determined by multiplex suspension array. BMC Immunol. 2010;11:59. https://doi.org/10.1186/1471-2172-11-59 PMid:21126355 PMCid:PMC3014878
27. Wu M-H, Lu C-W, Chuang P-C, Tsai S-J. Prostaglandin E2: The master of endometriosis? Exp Biol Med (Maywood). 2010;235(6):668-77. https://doi.org/10.1258/ebm.2010.009321 PMid:20511671
28. WHO. Guidelines for the regulatory assessment of medicinal products for use in self-medication. World Health Organization; 2000. Available at: https://apps.who.int/iris/handle/10665/66154 (Accessed: 6 February 2023).
29. Armour M, Parry K, Al-Dabbas MA, et al. Self-care strategies and sources of knowledge on menstruation in 12,526 young women with dysmenorrhea: A systematic review and meta-analysis. PLoS One. 2019;14(7):e0220103. https://doi.org/10.1371/journal.pone.0220103 PMid:31339951 PMCid:PMC6655766
30. De Sanctis V, Soliman AT, Daar S, et al. Prevalence, attitude and practice of self-medication among adolescents and the paradigm of dysmenorrhea self-care management in different countries. Acta Biomed. 2020;91(1):182-92.
31. Hawkey AJ, Ussher JM, Perz J, Metusela C. Experiences and constructions of menarche and menstruation among migrant and refugee women. Qual Health Res. 2017;27(10):1473-90. https://doi.org/10.1177/1049732316672639 PMid:27742765
32. Teherán AA, Piñeros LG, Pulido F, Mejía Guatibonza MC. WaLIDD score, a new tool to diagnose dysmenorrhea and predict medical leave in University students. Int J Womens Health. 2018;10:35-45. https://doi.org/10.2147/IJWH.S143510 PMid:29398923 PMCid:PMC5775738
33. Davidson JRT, Book SW, Colket JT, et al. Assessment of a new self-rating scale for post-traumatic stress disorder. Psychol Med. 1997;27(1):153-60. https://doi.org/10.1017/S0033291796004229 PMid:9122295
34. Ali M, Farooq N, Bhatti MA, Kuroiwa C. Assessment of prevalence and determinants of posttraumatic stress disorder in survivors of earthquake in Pakistan using Davidson trauma scale. J Affect Disord. 2012;136(3):238-43. https://doi.org/10.1016/j.jad.2011.12.023 PMid:22209270
35. Kohler O, Krogh J, Mors O, Benros ME. Inflammation in depression and the potential for anti-inflammatory treatment. Curr Neuropharmacol. 2016;14(7):732-42. https://doi.org/10.2174/1570159X14666151208113700 PMid:27640518 PMCid:PMC5050394
36. Lehrer S, Rheinstein PH. Nonsteroidal anti-inflammatory drugs (NSAIDs) reduce suicidal ideation and depression. Discov Med. 2019;28(154):205-12.
37. Hinz B, Brune K. Paracetamol and cyclooxygenase inhibition: Is there a cause for concern? Ann Rheum Dis. 2012;71(1):20-5. https://doi.org/10.1136/ard.2011.200087 PMid:22039164
38. Taler M, Gil-Ad I, Lomnitski L, et al. Immunomodulatory effect of selective serotonin reuptake inhibitors (SSRIs) on human T lymphocyte function and gene expression. Eur Neuropsychopharmacol. 2007;17(12):774-80. https://doi.org/10.1016/j.euroneuro.2007.03.010 PMid:17499975
39. Knights KM, Mangoni AA, Miners JO. Defining the COX inhibitor selectivity of NSAIDs: implications for understanding toxicity. Expert Rev Clin Pharmacol. 2010;3(6):769-76. https://doi.org/10.1586/ecp.10.120 PMid:22111779
40. Müller N, Schwarz MJ, Dehning S, et al. The cyclooxygenase-2 inhibitor celecoxib has therapeutic effects in major depression: Results of a double-blind, randomized, placebo controlled, add-on pilot study to reboxetine. Mol Psychiatry. 2006;11(7):680-4. https://doi.org/10.1038/sj.mp.4001805 PMid:16491133
41. Al-Smadi AM, Halaseh HJ, Gammoh OS, Ashour AF, Gharaibeh B, Khoury LS. Do chronic diseases and availability of medications predict post-traumatic stress disorder (PTSD) among Syrian refugees in Jordan? Pak J Nutr. 2016;15(10):936-41. https://doi.org/10.3923/pjn.2016.936.941
42. von Känel R, Hepp U, Kraemer B, et al. Evidence for low-grade systemic proinflammatory activity in patients with posttraumatic stress disorder. J Psychiatr Res. 2007;41(9):744-52. https://doi.org/10.1016/j.jpsychires.2006.06.009 PMid:16901505