

# Prevalence of post-traumatic stress disorder in HIV-positive women and its' related factors in an Iranian setting

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## Abstract

**Introduction:** Human immunodeficiency virus (HIV) infection is one of the most important human issues regarding health, social, and economic aspects. Possibility of being infected by the virus in women is as twice large compared to their male counterparts. Diagnosis of HIV disease could be a traumatic event leading to the onset and development of post-traumatic stress disorder (PTSD), which itself has many negative consequences. Hence, the aim of this study was to examine the prevalence and factors associated with PTSD in HIV patients to improve their care.

**Material and methods:** This study was a cross-sectional study carried out in AIDS Research Center, Clinic and Gynecology Ward, Imam Khomeini Hospital, during 2018-2019. Participants were selected using convenience sampling. Data were collected using two questionnaires, including Mississippi scale and demographic questionnaire. Data were analyzed using SPSS version 16.

**Results:** In this research, the mean score of PTSD in HIV-positive women was 100.45 ( $\pm$  21.86), with 44.5% (134 individuals) suffering from PTSD. Also, death of a family member, infertility history, housing status, history of violence, type and number of delivery, children's affection, education level, and history of imprisonment had the most significant association in HIV-positive women at 95% confidence level.

**Conclusions:** The results of this study highlighted the need to prioritize psychological (death of a family member and history of violence), economic and social (housing status), and medical needs (infertility history, childbirth, and status of children's HIV infection) of HIV-positive women who are experiencing various factors causing PTSD.

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**Key words:** post-traumatic stress disorder, HIV-positive women, Iranian setting.

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## Introduction

Human immunodeficiency virus (HIV) is an emerging disease that is known as “the plague of the century”, and every day the extent and dimensions of this disease are increasing. Although in some developed countries, the trend of infection incidence is decreasing, the overall trend, especially in African and Asian countries, is on the rise [1]. United Nations Programme on HIV/AIDS (UNAIDS) in 2019 emphasized the need to increase focus and attention on countries with highest rate of HIV in children, adolescents, and women, where 86% of pregnant women and 85% of all children and adolescents (0-19 years old) were living with HIV. Also, 85% of adolescent girls and women (ages 10-24) were infected with HIV [2]. According to the head of the Department of AIDS and Sexual Disease Prevention at the Ministry of Health, there are now 60,000 AIDS patients in Iran, 65% of whom are unaware of their disease. Statistics show that 31% of patients are females and 69% are males. Of these, 46.4% were infected through risky sexual behaviors, and 22% through drugs of abuse injections [3]. Ways of HIV transmission include sexual relationship, contact with blood and blood discharge, and mother-to-child transmission. However, the risk of transmission through these routes is not the same [4, 5].

Indeed, HIV infection is the largest fatal infectious disease and the fourth cause of death in the world, which can affect various dimensions of physical, social, spiritual, and emotional/mental health of a person [6, 7]. Results of a comprehensive research performed by the World Health Organization (WHO) on the consequences of HIV, revealed that this disease has created serious damages to families and communities. Therefore, the societies that are seriously affected by AIDS are losing an average of one to two percent of their annual economic growth [8]. Furthermore, women in these countries are challenged with severe economic, cultural, and social disadvantages, further increasing their vulnerability to this disease [8].

HIV infection is very different from other diseases due to its' different physical, social, economic, and mental dimensions [9]. This phenomenon, by its' nature, seriously affects all aspects of existence and life of patients, and even health of a society [10]. These individuals suffer from disadvantages in all areas of quality of life, especially mental, psychological, and social aspects. Although the rights and needs as well as interests related to sexual and reproductive health of HIV-positive men and women are similar to HIV-negative men and women, some biological and social differences between this group and HIV-negative individuals require special attention [11]. Women are twice more likely to be infected than men. Social inequality is another reason for the spread of the disease among women. Discrimination against women, either persistent or temporary, makes them vulnerable to AIDS. Childhood traumatic events, such as sexual-physical abuse and adulthood victimization, are higher in HIV-positive women than in general population [12, 13].

Post-traumatic stress disorder (PTSD) is an acute and disabling health problem. Clinically, PTSD is known as a history of exposure to a traumatic event, which may include symptoms of frustration, avoidance, negative changes in cognition and mood as well as changes in arousal and reaction. Trauma is an experience or a series of events or situations perceived by a person as a threatening, harmful physical, or emotional experience, and may lead to unpleasant consequences [14]. Symptoms of PTSD usually decrease over time; however, they can reappear if a person is re-exposed to the trauma [15]. Low-income women living in deprived, stressful situations with no social support as well as those with a history of exposure to violence are more likely to experience PTSD symptoms [16]. Regarding high prevalence (58%) of PTSD among HIV-positive people [17], risk factors of PTSD in people living with HIV include exposure to childhood trauma, recurrence of mental trauma, and exposure to traumatic events, which can strongly predict the occurrence of PTSD, such as sexual and physical abuse in childhood, rape, and crime-related violence. Many HIV-positive people live in poverty-stricken and violent environments. Also, they are deprived of social support with all these factors being associated with an increased risk of PTSD [18-21]. Diagnosis of HIV itself can be a traumatic event and leads to onset and progression of PTSD. Olley *et al.* observed that 36.4% of HIV-infected people with PTSD consider the diagnosis of HIV as the worst experienced event [22]. Untreated PTSD is associated with negative consequences, including major depression and drug use, poor physical health, and low quality of life. For HIV-positive people, the consequences of untreated PTSD can be dangerous and have a negative impact on their adherence to HIV medications, immune functioning, and risky sexual behaviors. Given that PTSD is associated with AIDS progression, PTSD treatment among HIV-infected women can be regarded as ‘treatment as prevention’ [23].

According to sustainable development goals (SDG) by 2030, and WHO women's health and welfare strategy by 2021, countries are committed to promote women's health [24]. WHO considers neglecting people with vulnerable health experiences (e.g., HIV-positive women) as discrimination, stigma, and violation against human rights. It also recognizes respect to human rights as the guarantee for survival and prosperity of the world. Further, equality and non-discrimination are at the core of global societies' efforts to achieve sustainable development goals [24, 25].

It is hoped that by striving to improve well-being and quality of life of HIV-positive people, we can move towards achieving sustainable development goals. Since promoting reproductive health is a research priority in both Iran and worldwide, the incidence of HIV among women in reproductive age in recent years is on the rise [26], and considering that this was the first study assessing the prevalence of PTSD among people with HIV in our country, researchers decided to determine the prevalence and associated factors related to PTSD in HIV-positive women in order to apply the results in promoting these women's health.

## Material and methods

This was a cross-sectional study carried out at AIDS Research Center, Clinic and Gynecology Ward, Imam Khomeini Hospital, during 2018-2019. Since the center is a referral center for AIDS care throughout the country, it has been selected as the research setting.

After reviewing the literature, the average prevalence of PTSD in HIV-positive women was 51%. Considering an error of 0.05, statistical confidence interval of 95% ( $\alpha = 0.05/\beta = 0.80$ ) and accuracy of 5%, after being included in the formula:

$$n = \frac{z^2_{(1/\alpha/2)} P (1 - P)}{d^2}$$

the sample size was determined as 390.

After receiving ethical approval by the Ethics Committee of Tehran University of Medical Sciences (approval No., IR.TUMS.FNM.REC.1397.159), the researcher and research assistant visited the research setting. After introducing themselves to the clinic officials and women referring to the respective centers for routine care, they explained the research objectives clearly to participants. Each of them signed a written consent, and they were assured that their information would be kept confidential at all stages of registration until publication, and that they would have the right to withdraw from study at any time. Initially, among all HIV-positive women who visited the clinic, 390 women who met inclusion criteria and signed an informed written consent form were selected using convenience sampling. Inclusion criteria were HIV-positive, Iranian nationality, literacy (reading and writing), absence of any mental disorders or malignant diseases. After completing the questionnaires, women diagnosed with PTSD were referred to a psychiatrist.

Data were collected using two questionnaires, which were completed through interviews. These questionnaires included Mississippi scale for evaluating PTSD and a demographic characteristics questionnaire.

Mississippi scale for assessing PTSD was reported and validated by Keane *et al.* in 1988, with reliability obtained through Cronbach's  $\alpha$  (0.86 to 0.94) [27]. Then, in 2015, it was re-validated by Raghobi *et al.* The acquired Cronbach's  $\alpha$  was 0.7. Also, its concurrent validity with three scales of life events, PTSD scale, and Padua inventory were 0.23, 0.82, and 0.75, respectively [28]. In this study, Cronbach's  $\alpha$  was 77%. This scale contain 35 items and 4 sub-scales, including re-experience, isolation and numbness, over-arousal, and self-harm, which are scored on a five-point Likert scale from 1 = 'always' to 5 = 'never'. The total score ranged between 35 and 175; score 107 and higher indicated the presence of PTSD. In this scale, 8 questions (No. 6, 17, 19, 22, 24, 27, 30, and 34) were reversely scored [27].

## Statistical analysis

Data were analyzed using SPSS version 16. Furthermore, for correcting missing data, participants were contacted

again, and missing data were completed through telephone or in-person interviews.

Kolmogorov-Smirnov test was used to determine normal distribution of variables. Also, descriptive statistics were used to determine distribution of frequencies, tables, and central indices. Spearman's,  $\chi^2$ , and Kruskal-Wallis tests were applied to find a correlation between the variables. Finally, multiple regression with a significance level of  $p < 0.05$  was used to predict status of the variables.

## Results

In total, 390 HIV-positive women participated in the study. The mean score of PTSD in these women was 100.45 ( $\pm 21.86$ ) with 44.5% (134 individuals) suffering from PTSD. The mean age of women was 35.63 ( $\pm 8.86$ ) years, and disease duration was 6.99 ( $\pm 4.7$ ) years. Specifically, 36.3% of women had secondary education and diploma, 81.7% were housewives, 68% were married and lived with their husbands and children, 41.3% came from a low economic class, and 87% were living in urban areas. Further, 7% of women reported a history of infertility, 38.7% domestic violence, 10.7% rape in adulthood and 13% in childhood, 9.7% imprisonment, 5.3% addiction, and 58% stated at least one of their family members had died (Table 1).

Since the variables did not follow the normal distribution according to Kolmogorov-Smirnov test ( $p = 0.000$ ), the association of variables with PTSD was evaluated using Spearman's,  $\chi^2$ , and Kruskal-Wallis tests. In this study, there was a significant statistical difference between education level, occupation, husband's occupation, contraceptive methods, housing status, history of infertility, duration of illness, history and type of delivery, death of a family member, abuse history, history of childhood abuse, history of imprisonment, domestic violence, opioid history, status of husband's infection, and status of children's infection with PTSD.

In Table 2 and Figure 1 show stepwise regression analysis performed to confirm variables that were most associated with PTSD in HIV-infected women. The most significant association was at 95% confidence level.

## Discussion

The correlation between demographic variables and factors related to PTSD in HIV-positive women indicated that these women experience PTSD continually. This study is the newest research to assess these factors. The results should be applied in the clinics providing care for HIV-positive women.

In the present study, the prevalence of PTSD in HIV-positive women was reported as 44.5%, which is higher than national and global averages reported in the general population [29]. Such a high prevalence might be due to their poor social and economic status, since most of these women were housewives without higher education, lived in a rented home, and were economically distressed. On the other hand, they were struggling with costs of medical care and stigma in addition to their daily

**Table 1.** Mean scores of post-traumatic stress disorder (PTSD) symptoms regarding socio-demographic variables and related factors in HIV-positive women

Factor		p-value
Age, mean $\pm$ SD (years)	35.63 $\pm$ 8.86	$r = 0.037, p = 0.33$
Husband's age, mean $\pm$ SD (years)	39.62 $\pm$ 10.93	$r = 0.092, p = 0.119$
Marriage status, <i>n</i> (%)		
Single	17 (4.3)	$\chi^{2c} = 5.67, p = 0.129$
Married	265 (68.0)	
Divorced	67 (17.4)	
Widow	41 (10.3)	
Educational level, <i>n</i> (%)		
Primary education	69 (17.7)	$\chi^{2c} = 10.65, p^{**} = 0.016$
Secondary education	96 (24.7)	
High education	178 (45.6)	
University	47 (12.0)	
Occupation, <i>n</i> (%)		
Housewife	319 (81.7)	$\chi^{2a} = 78.98, p = 0.023$
Employed	71 (18.3)	
Husband's occupation, <i>n</i> (%)		
Unemployed	92 (23.7)	$\chi^{2a} = 461.38, p = 0.000$
Employed	298 (76.3)	
Number of children, mean $\pm$ SD (years)	1.13 $\pm$ 0.89	$r = 0.04, p = 0.47$
Marriage duration, mean $\pm$ SD (years)	8.68 $\pm$ 6.72	$r = 0.032, p = 0.58$
Contraceptive method, <i>n</i> (%)		
No	132 (33.6)	$\chi^{2c} = 20.40, p^{**} = 0.000$
Condoms	230 (59.0)	
Pill	18 (4.7)	
Abstinence	10 (2.7)	
Economic status, <i>n</i> (%)		
Good	7 (1.7)	$\chi^{2c} = 5.56, p = 0.059$
Moderate	222 (57.0)	
Bad	161 (41.3)	
Housing status, <i>n</i> (%)		
Personal	136 (35.0)	$\chi^{2c} = 5.74, p = 0.557$
Rental	247 (63.3)	
Others	7 (1.7)	
Abortion history, <i>n</i> (%)		
Yes	165 (42.3)	$\chi^{2a} = 122.81, p = 0.228$
No	225 (57.7)	
Infertility history, <i>n</i> (%)		
Yes	27 (7.0)	$\chi^{2a} = 154.82, p^{**} = 0.005$
No	363 (93.0)	
Pregnancy history, <i>n</i> (%)		
Yes	321 (79.0)	$\chi^{2a} = 172.54, p = 0.000$
No	69 (21.0)	
Delivery history, <i>n</i> (%)		
No	92 (23.7)	$\chi^{2c} = 1.27, p^{**} = 0.01$
NVD	119 (30.7)	
C/S	159 (40.6)	
NVD and C/S	20 (5.0)	

Table 1. Cont.

Factor		p-value
Number of deliveries, mean $\pm$ SD (years)	1.14 $\pm$ 0.89	$r = 1.31, p = 0.04$
Disease duration (HIV), mean $\pm$ SD (years)	6.99 $\pm$ 4.7	$r = 1.27, p = 0.02$
Way of HIV infection, <i>n</i> (%)		
Unknown	49 (12.7)	$\chi^{2c} = 0.255, p = 0.968$
Sexual	290 (74.3)	
Injection	7 (1.7)	
Contaminated blood	10 (2.7)	
Others	34 (8.6)	
Abuse history, <i>n</i> (%)		
Yes	32 (10.7)	$\chi^{2a} = 141.22, p^{**} = 0.032$
No	265 (88.3)	
History of childhood abuse, <i>n</i> (%)		
Yes	42 (13.0)	$\chi^{2a} = 432.06, p = 0.000$
No	348 (87.0)	
Domestic violence, <i>n</i> (%)		
Yes	151 (38.7)	$\chi^{2a} = 149.69, p^{**} = 0.01$
No	239 (61.3)	
Death of a family member, <i>n</i> (%)		
Yes	226 (58.0)	$\chi^{2a} = 166.70, p^{**} = 0.000$
No	160 (42.0)	
History of imprisonment, <i>n</i> (%)		
Yes	38 (9.7)	$\chi^{2a} = 295.75, p^{**} = 0.000$
No	352 (90.3)	
STD history, <i>n</i> (%)		
HPV	58 (15.0)	$\chi^{2c} = 3.02, p = 0.554$
HSV	16 (4.0)	
Gongora	4 (1.0)	
Chlamydia	3 (0.7)	
No	309 (79.3)	
Opioid history, <i>n</i> (%)		
Yes	21 (5.3)	$\chi^{2a} = 193.14, p^{**} = 0.000$
No	369 (94.7)	
Using alcohol or wine, <i>n</i> (%)		
Yes	44 (11.3)	$\chi^{2a} = 65.96, p = 0.17$
No	346 (88.7)	
Factor		p-value
Cigarettes smoking, <i>n</i> (%)		
No	300 (77.0)	$\chi^{2c} = 7.58, p = 0.055$
1-3	39 (10.0)	
4-6	21 (5.3)	
7-10	8 (2.0)	
$\geq 11$	22 (5.7)	
Duration of cigarettes smoking, mean $\pm$ SD (years)	2.09 $\pm$ 5.95	$r = 0.04, p = 0.42$
ART (treatment history), <i>n</i> (%)		
Yes	377 (96.7)	$\chi^{2a} = 54.71, p = 0.524$
No	13 (3.3)	

Table 1. Cont.

Factor		p-value
Availability of HIV medicine, n (%)		
Yes	110 (21.7)	$\chi^{2c} = 2.226, p = 0.329$
Partial access	177 (45.3)	
No	103 (33.0)	
Source of getting information about disease, n (%)		
Healthcare providers	312 (80.0)	$\chi^{2c} = 3.905, p = 0.272$
Radio and TV	4 (1.0)	
Book and magazine	9 (2.7)	
Internet	62 (16.0)	
Others	3 (0.3)	
Status of husband's infection, n (%)		
Yes	251 (64.3)	$\chi^{2a} = 365.37, p = 0.000$
No	139 (35.7)	
Status of children's infection, n (%)		
No children	95 (24.3)	$\chi^{2c} = 11.44, p^{**} = 0.022$
Yes	26 (6.7)	
No	269 (69)	
Family member's awareness of person's disease, n (%)		
Yes	257 (66.0)	$\chi^{2a} = 163.38, p = 0.586$
No	133 (34.0)	

<sup>a</sup> $\chi^2$ ; <sup>b</sup>Spearman test; <sup>c</sup>Kruskal-Wallis; <sup>\*\*</sup>correlation is significant at the 0.01 level (2-tailed)

livelihoods. In these women, the rate of fertility, delivery, history of rape in adulthood, domestic violence, death of a family member, history of imprisonment, and addiction were 79%, 76.3%, 10.7%, 38.7%, 58%, 9.7%, and 5.3%, respectively.

Lorraine *et al.* also showed that the rate of PTSD in HIV-positive women varied from 5% to 74%, which was far higher than in general population (7-10%) [30]. In another study performed in South Africa by Lindi *et al.*, the prevalence of PTSD was 54.1% life-time and 40% in HIV-positive women [31]. The results of the current study are consistent with a study of Machtinger *et al.* in USA, where the prevalence of psychological trauma and PTSD was reported as 30% in HIV-positive women and 55% in those experiencing sexual partner violence [29]. Further, another study in Iran aiming to determine every single factor associated with PTSD showed that childbirth, occupation-related factors, earthquake, war, burning, accident, and rape were 25%, 30%, 58%, 47%, 11%, and 74% associated with PTSD, respectively [32]; these results were almost consistent with the present study. Another study performed by Yvette *et al.* to assess the effects of physical, behavioral, and social trauma in California found that life-time trauma, especially in childhood, was significantly associated with anxiety, depression, and PTSD in HIV-positive women. However, in these women, PTSD was also related to alcohol and drug use, and these factors were associated with diminished quality of life, greater traumatic life experience, decreased HIV medicine intake, and consequently, increased viral burden of HIV [33]. Since

alcohol and drug use in this study were significantly lower than those of Cuca *et al.*'s (11.3% and 5.3%), the results of this study may be a stronger reason to support the association between trauma and life-long violence with PTSD.

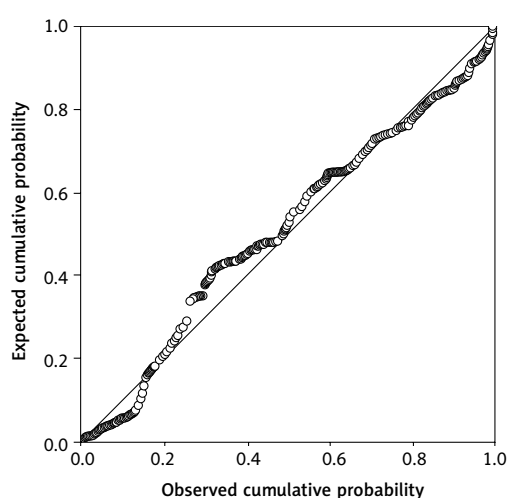
A study carried out in Poland by Rzeszutek *et al.* showed that personality traits (neuroticism) and socio-medical variables (antiviral therapy, education or training, and relationship status) moderated the relationship between life satisfaction and severity of PTSD [34]. Another study by Oniszczenko *et al.* found that religious fundamentalism and life satisfaction were responsible for 34% of severity of PTSD changes in HIV-positive individuals. Meanwhile, the level of education of these patients was the mediator of this relationship [35]. These results were almost in line with those of the present study. According to the findings, the level of education, being single, poor economic status, living in a rented or homelessness, living in urban areas compared with rural areas, lacking knowledge about the disease or not having access to information, and increased duration of illness were identified as contributing factors to the increase in PTSD.

Limitations of the present study included the impact of patients' mental state on answering questions, for which the researcher attempted to provide appropriate communication with patients and explain research goals in quiet and private environment, and encourage them to participate in the study. Also, according to the Head of the Department of AIDS and Sexual Disease Prevention Ministry of Health in Iran, 65% of Iranian people infected by HIV are still un-

**Table 2.** Step-wise regression analyses of significant socio-demographic variables and related factors with PTSD

Factor	B	SE*	b	t	p-value	R	R <sup>2</sup>	Tolerance	VIF	ARs	95% CI
Death of a family member	-13.10	2.45	-0.29	-5.34	0.000	0.296	0.088	1.000	1.000	0.085	-17.93 to -8.27%
Infertility history	-18.97	4.29	-0.23	-4.42	0.000	0.380	0.144	0.999	1.001	0.138	-27.41 to 10.52%
Housing status	8.17	2.27	0.189	3.59	0.000	0.424	0.180	1.000	1.000	0.172	3.69 to 12.64%
Domestic violence	-8.77	2.26	-0.20	-3.86	0.000	0.469	0.220	0.985	1.015	0.209	-13.24 to -4.31%
Type of delivery	-4.67	1.25	-0.18	-3.72	0.000	0.505	0.255	0.996	1.004	0.254	-7.14 to -2.20%
Number of deliveries	4.21	1.47	0.178	2.85	0.005	0.525	0.275	0.674	1.48	0.26	1.30 to 7.12%
Status of children's infection	-5.53	2.22	-0.22	-2.48	0.02	0.539	0.290	0.293	3.41	0.273	-9.92 to -1.15%
Educational level	-2.68	1.27	-0.11	-2.05	0.041	0.548	0.300	0.833	1.201	0.281	-5.14 to -0.113%
History of imprisonment	-7.00	3.45	-0.105	-2.03	0.043	0.557	0.310	0.890	1.12	0.289	-13.80 to -0.21%

SE - standard error

**Figure 1.** Normal P-P plot of regression standardized residual dependent variable: total

aware of their illness and have not referred to AIDS Prevention and Infectious Disease Prevention Department, which may undermine generalizability of the results of the present study to the current population.

## Conclusions

The results of this study highlighted the need to prioritize the needs of HIV-positive women who experience various issues of PTSD. As many of these women also suffer from a number of economic and social problems in the context of HIV stigma resulting from traumas and violence, this stressful period of women's lives becomes a major crisis. Thus, attention should be paid to these women through psychological, social, economic, and medical interventions. It is hoped that the results of this study can be effective in designing comprehensive treatment in care centers by nurses, midwives, and physicians. It is recommended that future studies focusing on supportive interventions for these women should be designed to address the causes of PTSD.

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## Conflict of interest

The authors declare no conflict of interest.

## References

- UNAIDS. Report on the Global AIDS Epidemic. Geneva: UNAIDS; 2013. Available at: <http://www.unaids.org/globalreport/Globalreport.htm.2013> (Accessed: December 2013).
- Start Free, Stay Free, AIDS Free, 2019 report. Available at: [https://www.unaids.org/sites/default/files/media\\_asset/20190722\\_UNAIDS\\_SFSAF\\_2019\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/20190722_UNAIDS_SFSAF_2019_en.pdf).
- ISNA. Available at: <https://www.isna.ir/news/98030401567/>.
- [www.health.behdasht.gov.ir](http://www.health.behdasht.gov.ir).
- Hamzeh B, Moradi Z, Najafi F, Moradinazar M. Pattern of substance abuse and prevalence of risk factors of HIV and hepatitis among addicted women in Western Iran. *Int J Prev Med* 2019; 10: 58.
- Sherr L, Nagra N, Kulubya G, Catalan J, Clucas C, Harding R. HIV infection associated post-traumatic stress disorder and post-traumatic growth – a systematic review. *Psychol Health Med* 2011; 16: 612-629.
- Global report. UNAIDS report on the global AIDS epidemic 2013. Joint United Nations Programme on HIV/AIDS (UNAIDS), 2013. Available at: [https://www.unaids.org/sites/default/files/media\\_asset/UNAIDS\\_Global\\_Report\\_2013\\_en\\_1.pdf](https://www.unaids.org/sites/default/files/media_asset/UNAIDS_Global_Report_2013_en_1.pdf).
- Rooney G. Psychology in patients with HIV/AIDS and psychiatry services in world. *J WHO* 2005; 6: 192-198.
- Mangassarian S, Sumner L, O'Callaghan E. Sexual impulsivity in women diagnosed with borderline personality disorder: a review of the literature. *Sexual Addiction & Compulsivity* 2015; 22: 195-206.
- Folayan MO, Harrison A, Brown B, et al. Associations between forced sexual initiation, HIV status, sexual risk behavior, life stressors, and coping strategies among adolescents in Nigeria. *PLoS One* 2016; 11: e0155210.

11. Gruskin S, Ferguson L, O'Malley J. Ensuring sexual and reproductive health for people living with HIV: an overview of key human rights, policy and health systems issues. *Reprod Health Matters* 2007; 15 (29 Suppl): 4-26.
12. Shamu S, Shamu P, Zarowsky Ch, Temmerman M, Shefer T, Abrahams N. Does a history of sexual and physical childhood abuse contribute to HIV infection risk in adulthood? A study among post-natal women in Harare, Zimbabwe. *PLoS One* 2019; 14: e0198866.
13. Tsuyuki K, Cimino AN, Holliday ChN, Campbell JC, Al-Alusi NA, Stockman JK. Physiological changes from violence-induced stress and trauma enhance HIV susceptibility among women. *Curr HIV/AIDS Rep* 2019; 16: 57-65.
14. SAMHSA. SAMHSA's concept of trauma and guidance for a trauma-informed approach. No. (SMA) 14-4884. Available at: <http://store.samhsa.gov/shin/content/SMA14-4884/SMA14-4884.pdf>.
15. Galea S, Ahern J, Tracy M, et al. Longitudinal determinants of post-traumatic stress in a population-based cohort study. *Epidemiology* 2008; 19: 47-54.
16. Gapen M, Cross D, Ortigo K, et al. Perceived neighborhood disorder, community cohesion, and PTSD symptoms among low-income African Americans in an urban health setting. *Am J Orthopsychiatry* 2011; 81: 31-37.
17. Cohen MH, Fabri M, Cai X, et al. Prevalence and predictors of post-traumatic stress disorder and depression in HIV-infected and at-risk Rwandan women. *J Womens Health (Larchmt)* 2009; 18: 1783-1791.
18. Kalichman SC, Sikkema KJ, DiFonzo K, Luke W, Austin J. Emotional adjustment in survivors of sexual assault living with HIV-AIDS. *J Trauma Stress* 2002; 15: 289-296.
19. Lewis CF. Post-traumatic stress disorder in HIV-positive incarcerated women. *J Am Acad Psychiatry Law* 2005; 33: 455-464.
20. Cusack SE, Hicks TA, Bourdon J. Prevalence and predictors of PTSD among a college sample. *J Am Coll Health* 2019; 67: 123-131.
21. Rinehart R, Rao D, Amico RK, et al. Experienced HIV-related stigma and psychological distress in Peruvian sexual and gender minorities: a longitudinal study to explore mediating roles of internalized HIV-related stigma and coping styles. *AIDS Behav* 2019; 23: 661-674.
22. Olley BO, Zeier MD, Seedat S, Stein DJ. Post-traumatic stress disorder among recently diagnosed patients with HIV/AIDS in South Africa. *AIDS Care* 2005; 17: 550-557.
23. McLean CP, Fitzgerald H. Treating posttraumatic stress symptoms among people living with HIV: a critical review of intervention trials. *Curr Psychiatry Rep* 2016; 18: 83.
24. WHO. Available at: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0006/318147/Womens-health-well-being-Europe-beyond-mortality-advantage.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0006/318147/Womens-health-well-being-Europe-beyond-mortality-advantage.pdf?ua=1).
25. WHO. Available at: <http://www.who.int/gender-equity-rights/news/human-rights-photo-story/en/>.
26. UNFPA. Available at: <http://iran.unfpa.org/ICPD-MDGs-fa.asp>.
27. Keane TM, Kolb LC, Kaloupek DG, et al. Utility of psychophysiology measurement in the diagnosis of posttraumatic stress disorder: results from a Department of Veteran's Affairs Cooperative Study. *J Consult Clin Psychol* 1998; 66: 914-923.
28. Raghibi M, Shirabadi A, Moallemi S, Narimani M. Demographic characteristics and post-traumatic stress disorder in prison inmates of Zahedan, Iran. *Journal of Military Caring Sciences* 2016; 3: 10-17.
29. Machtinger EL, Wilson TC, Haberer JE, Weiss DS. Psychological trauma and PTSD in HIV-positive women: a meta-analysis. *AIDS Behav* 2012; 16: 2091-2100.
30. Sherr L, Nagra N, Kulubya G, Catalan J, Clucas C, Harding R. HIV infection associated post-traumatic stress disorder and post-traumatic growth – a systematic review. *Psychol Health Med* 2011; 16: 612-629.
31. Martin L, Kagee A. Lifetime and HIV-related PTSD among persons recently diagnosed with HIV. *AIDS Behav* 2011; 15: 125-131.
32. Sepahvand H, Mokhtari Hashtjini M, Salesi M, Sahraei H, Pirzad Jahromi G. Prevalence of post-traumatic stress disorder (PTSD) in Iranian population following disasters and wars: a systematic review and meta-analysis. *Iranian Journal of Psychiatry and Behavioral Sciences* 2019; 13.
33. Cuca YP, Shumway M, Machtinger EL, et al. The association of trauma with the physical, behavioral, and social health of women living with HIV: pathways to guide trauma-informed health care interventions. *Womens Health Issues* 2019; 29: 376-384.
34. Rzeszutek M, Oniszczenko W, Gruszczynska E. Satisfaction with life, Big-Five personality traits and posttraumatic growth among people living with HIV. *Journal of Happiness Studies* 2019; 20: 35-50.
35. Oniszczenko W, Rzeszutek M, Firląg-Burkacka E. Religious fundamentalism, satisfaction with life and posttraumatic stress symptoms intensity in a Polish sample of people living with HIV/AIDS. *J Relig Health* 2019; 58: 168-179.