

# Prevalence of Post Traumatic Stress Disorder (PTSD) in Internally Displaced People from Khartoum After Sudan War in April 2023.

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## Abstract

Internal displacement is emerging as one of the greatest challenges facing humanity. The displacement of people leads to various mental health problems such as PTSD, depression and anxiety in these groups of people, many studies have shown that PTSD is one of the most common psychiatric disorders diagnosed in displaced persons. This study aim to assess prevalence of PTSD in internally displaced people from Khartoum after Sudan war to orient the efforts toward the manipulation factors influencing their psychological health. This study is a descriptive cross-sectional community based study carry out among all people above 18 years old & internally displaced from Khartoum state by using self administrated questionnaire adapted from PCL-5 for assessed the 20 DSM-5 symptom of PTSD. The sample size was 666 participant, 50.8% of them were male, and most of them were 18 -25 years old (54.1%), displaced from Khartoum to Gaziera state in April (48.6%, 23.9%, 37.8%) respectively, also we founded that prevalence rate of PTSD was 311, 46.7% among the study sample and their was a significant relationship between PTSD and sex & age ( p value < 0.001, 0.010 respectively). The findings call for governments to adequately plan for and programme mental health interventions for internally displacement peoples.

**Keywords:** post-traumatic stress disorder, Internally displaced person, Khartoum, Sudan, War, Prevalence, Trauma.

## Introduction

According to the United Nations, internally displaced people are “persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized state border”[1]

Internal displacement is emerging as one of the greatest challenges facing humanity. The displacement of people leads to various mental health problems such as post-traumatic stress disorder (PTSD), depression and anxiety in these groups of people [2]. Many studies have shown that PTSD is one of the most common psychiatric disorders diagnosed in displaced persons [3].

Post-traumatic stress disorder is defined in the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM5), as being composed of four groups of symptoms that include intrusive and recurring memories of trauma, avoidance of trauma-related stimuli, numbness, and/or negative mood or changes in perception related to trauma and changes in reactivity and arousal [4].

According to the result of a meta-analysis, about 242 million adult war survivors residing in post-war regions are estimated to suffer from PTSD and about 238 million adult survivors of war suffer from major depressive disorder [5]. The contributions of post-traumatic stress disorder (PTSD) to the global burden of disease is estimated to be almost 4% of the world's population [6].

Post-traumatic stress disorder has many psychosocial effects on individuals and society in general. At the individual level, victims of this disorder often experience drug use and abuse, depression, anxiety, dissociation and disassociate disorders, personality disorders, psychosis, and cognitive disorders. At a societal level, the possible consequences can be separation from families, homelessness, poverty and imprisonment [7].

Conflict exposes displaced populations to violence and high levels of stress, causing dramatic rises in mental illness that can continue even for long time after conflict has ceased. Displacement disrupts social support structures and exposes civilian populations to high levels of stress [8,9].

Displaced persons may face both direct consequences, such as separation from their families, trauma, loss of properties and loved ones, and gender-based violence, and indirect consequences, such as increased malnutrition, post-traumatic stress disorder and communicable diseases [10,11,12,13].

According to united nation of displacement people the outbreak of fighting in Sudan has forced over 1.6 million of people to displaced, of which nearly half are children. This is in addition to the almost 3.8 million people who were already displaced. More than half of the population now require aid and protection. The number of people in need has increased from 15.8 million before the current crisis to 24.7 million in June,2023.[14]

Post traumatic stress disorder puts people's lives and future at risk. Timely treatment can save them and give them adequate support, so assessed prevalence of post traumatic stress disorder play a major role and the first step to help internally displaced people. So the ultimate reason for this research will be to assess mentally well-being of internally displaced people in Sudan to orient the efforts toward the manipulation factors influencing their psychological health and determine prevalence of post traumatic stress disorder to help fasting of the proper intervention, in addition to that filling the gap of decrease recent study about prevalence of post traumatic stress disorder in internally displaced people in Sudan.

The aim of this study to estimate the prevalence of PTSD in internally displaced people from Khartoum and determine the association between PTSD prevalence and age, sex, from where displaced, to where displaced and when did they displaced.

## **Material & Method**

### **Study design & area**

A descriptive cross-sectional community based study was carry out in all Sudan states which people displaced to it from Khartoum state.

### **Study population & sample**

The targeted populations were all people above 18 years old & internally displaced from Khartoum state after April, 2023 war and showed willingness to participated in the study , people whom less than 18

years old or whom displaced before April, 2023 war and people whom didn't show willingness to participated in the study were excluded from the study.

we calculated sample size by using the equation:

$$n = z^2 \times p \times q \div d^2$$

n: Sample size

z: Standard deviation (2.58)

p: Proportion of population

q: Error sample (1 -p)

d: Degree of precision (0.05) [15]

$$n = (2.58)^2 \times 0.5 \times 0.5 \div (0.05)^2 = 666.$$

So 666 participants were taken with response rate 100%.

### Variables

- Prevalence related independent variable are : age, sex, residence, displaced state, time of displaced.
- Prevalence related dependent variable are : post traumatic stress disorder.

### Sample technique & tools

We used simple random technique. and the data was collected by self administrated questionnaire adapted from PCL-5 for assessed the 20 DSM-5 symptom of PTSD, the questionnaire was translated to Arabic language then back to English, the questionnaire consist of:

- Sociodemographic characteristics (5 items)
- PCL-5 checklist (20 items)

### Data analysis

The Program of analysis was SPSS version 25 descriptive analysis, chi-square test of significance was conducted to determine the statistical significance. A P value < 0.05 level was considered statistically significant. The figures made by excel 2019.

### PCL-5 checklist scoring and interpretation

Scores consist of a total symptom severity score (from 0 to 80) and scores for four sub scales:

Re-experiencing (items 1-5 – max score = 20) , Avoidance (items 6-7 – max score = 8), Negative alterations in cognition and mood (items 8-14 – max score = 28), Hyper-arousal (items 15-20 – max score = 24)

In addition to a raw score being presented, a “mean score” is also computed, which is the sub-scale score divided by the number of items. These scores range between 0 to 4, where higher scores represent higher severity. Consistent with the likert scale:

0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit, 4 = Extremely

There are two methods for determining a provisional PTSD diagnosis:

- A cut-off raw score is  $\geq 33$  for a provisional diagnosis of PTSD.[16]
- Examine items rated as 2=“Moderately” or higher as an endorsed symptom, then following the DSM-5 diagnostic rule which requires at least: 1 B item (questions 1-5), 1 C item (questions 6-7), 2 D items (questions 8-14), 2 E items (questions 15-20).

**Results**

The research findings are presented in Tables 1, 2, 3 and 4 below and in Figures 1, 2, 3, 4, 5 and 6 below. The data showed the sociodemographic characteristics, the prevalence of PTSD among internally displaced people from Khartoum state and it’s crosstabulation to the sociodemographic characteristics and significant test. Also the result showed the answer of the PCL-5 checklist and total score histogram. The sociodemographic characteristics considered in this study are gender, age, from which part of Khartoum state displaced, to which Sudan state displaced and the time of displaced.

Table 1 : Sociodemographic characteristics of research participants (n=666)

Characteristics	Value	Frequency	Percent
	Age	18 - 25 years	360
	26 - 35 years	209	31.4
	36 - 45 years	56	8.4
	More than 45 years	41	6.2
Sex	Female	328	49.2
	Male	338	50.8
From where did you displaced?	Khartoum	324	48.6
	Omdurman	158	23.7
	Bahri	115	17.3
	Eest Nile	69	10.4
To where did you displaced ?	Gaziera state	159	23.9
	Northan state	116	17.4
	Red sea state	65	9.8
	River Nile state	129	19.4
	White Nile state	48	7.2
	Other	149	22.4
When did you displaced ?	April	252	37.8
	May	247	37.1
	June	118	17.7
	July	49	7.4

Table 1 (above) present about sociodemographic characteristics that the majority were : 18 - 25 years old (360, 54.1%), male (338, 50.8), displaced from Khartoum -Khartoum state divided to 4 part and ‘‘Khartoum’’ is one of them - (342, 48.6%), displaced to Gaziera state (159, 23.9%) and displaced at April (252, 37.8%).

Table 2 : PCL-5 checklist answers of research participants (n=666)

Characteristics	Not at all	A little bit	Moderate	Quiet a bit	Extremely
	N(%)	N(%)	N(%)	N(%)	N(%)
1. Repeated, disturbing, and unwanted memories of the stressful experience?	76(11.4)	166(24.9)	179(26.9)	193(29.0)	52(7.8)
2. Repeated, disturbing dreams of the stressful experience?	202(30.3)	215(32.3)	143(21.5)	90(13.5)	16(2.4)
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	167(25.1)	159(23.9)	158(23.7)	142(21.3)	40(6.0)
4. Feeling very upset when something reminded you of the stressful experience?	87(13.1)	145(21.8)	135(20.3)	198(29.7)	101(15.2)
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	271(40.7)	138(20.7)	114(17.1)	109(16.4)	34(5.1)
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	124(18.6)	159(23.9)	134(20.1)	170(25.5)	79(11.9)
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	231(34.7)	140(21.0)	129(19.4)	114(17.1)	52(7.8)
8. Trouble remembering important parts of the stressful experience?	310(46.5)	148(22.2)	96(14.4)	82(12.3)	30(4.5)
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	160(24.0)	105(15.8)	137(20.6)	152(22.8)	112(16.8)
10 Blaming yourself or someone else for the stressful experience or what happened after it?	265(39.8)	122(18.3)	104(15.6)	126(18.9)	49(7.4)

<b>11</b> Having strong negative feelings such as fear, horror, anger, guilt, or shame?	115(17.3)	141(21.2)	139(20.9)	163(24.5)	108(16.2)
<b>12</b> Loss of interest in activities that you used to enjoy?	87(13.1)	107(16.1)	133(20.0)	192(28.8)	147(22.1)
<b>13</b> Feeling distant or cut off from other people?	82(12.3)	103(15.5)	136(20.4)	216(32.4)	129(19.4)
<b>14</b> Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	112(16.8)	138(20.7)	141(21.2)	166(24.9)	109(16.4)
<b>15</b> Irritable behavior, angry outbursts, or acting aggressively?	222(33.3)	152(22.8)	116(17.4)	118(17.7)	58(8.7)
<b>16</b> Taking too many risks or doing things that could cause you harm?	360(54.1)	143(21.5)	86(12.9)	54(8.1)	23(3.5)
<b>17</b> Being “superalert” or watchful or on guard?	165(24.8)	144(21.6)	163(24.5)	128(19.2)	66(9.9)
<b>18</b> Feeling jumpy or easily startled?	130(19.5)	143(21.5)	149(22.4)	153(23.0)	91(13.7)
<b>19</b> Having difficulty concentrating?	131(19.7)	143(21.5)	155(23.3)	145(21.8)	92(13.8)
<b>20</b> Trouble falling or staying asleep?	126(18.9)	109(16.4)	150(22.5)	167(25.1)	114(17.1)

Table 2 ( above) shows the PCL-5 checklist questions & answers of the research participants, the PCL-5 sub class to: re-experiencing questions (Q 1-5) , avoidance questions (Q 6-7), negative alterations in cognition and mood questions (Q 8-14), hyper-arousal questions (Q 15-20).

Table 3: PTSD prevalence rate among the research participants (n=666)

	Frequency	Percent	Valid Percent	Cumulative Percent
PTSD negative	355	53.3	53.3	53.3
PTSD positive	311	46.7	46.7	100.0
Total	666	100.0	100.0	

Table 3 ( above) shows about PTSD prevalence rate among research participants that the majority don't had PTSD (335, 53.3%) when people had PTSD were 311, 46.7%.

Figure 1 : shows histogram of the research participants total score in PCL-5 checklist ( min = 0, max = 80).

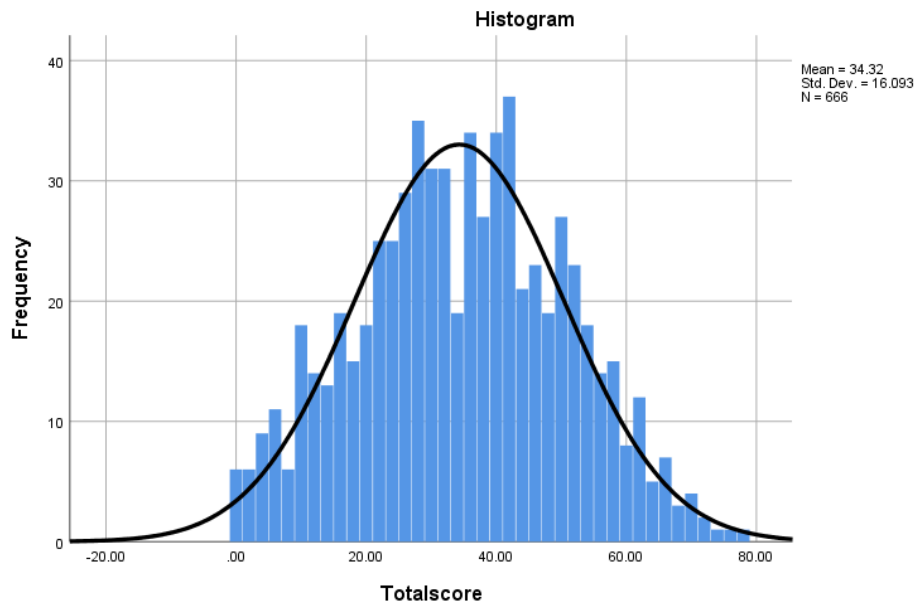


Figure 1 (above) present about PCL-5 total score histogram, that it's with the normal distribution curve with mean 34.32 and standard deviation 16.09.

Figure 2: shows participants age \* PTSD prevalence crosstabulation (n=666).

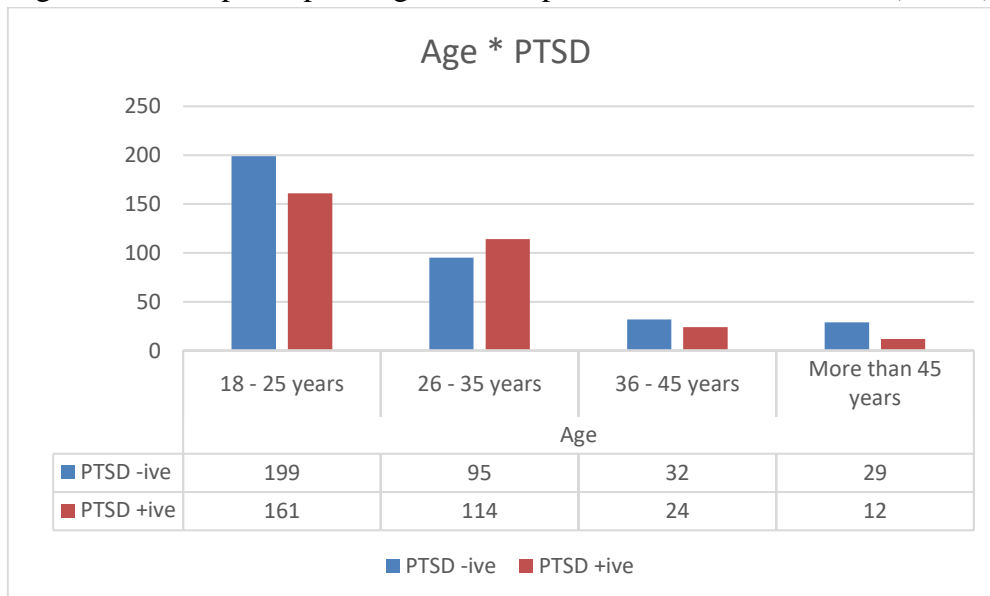


Figure 2 (above) present about age and PTSD prevalence crosstabulation that the majority with 18 - 25 years and 199 of them don't had PTSD.

Figure 3: shows participants sex \* PTSD prevalence crosstabulation (n=666).

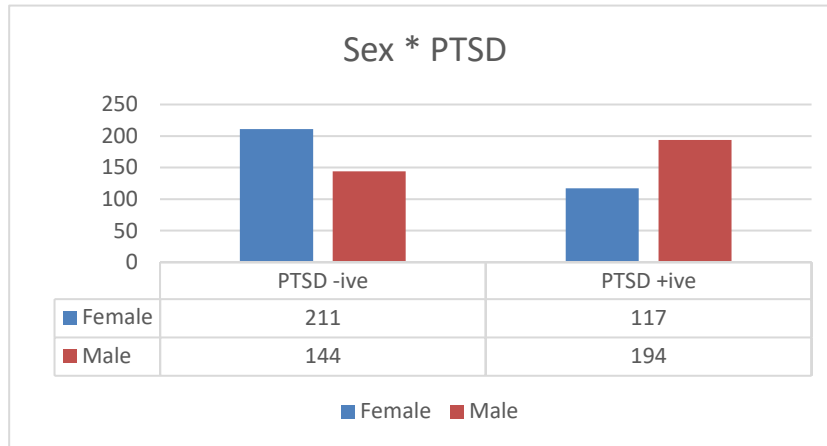


Figure 3 (above) present about sex and PTSD prevalence crosstabulation that the majority of female don't had PTSD (211), when the majority of male had PTSD (194).

Figure 4: shows participants from where displaced \* PTSD prevalence crosstabulation (n=666).

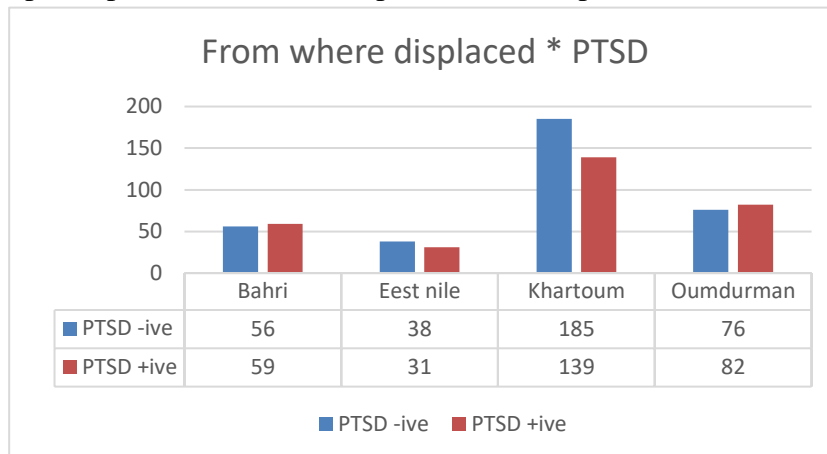


Figure 4 (above) present about from where displaced and PTSD prevalence crosstabulation, that the majority displaced from Khartoum and the majority of them don't had PTSD (185).

Figure 5: shows participants to where displaced \* PTSD prevalence crosstabulation (n=666).

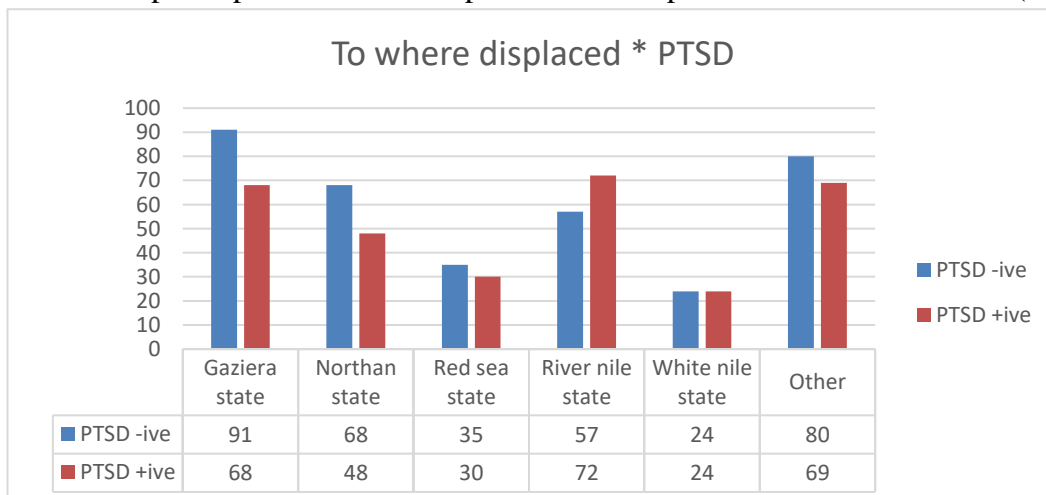




Figure 5 (above) present about to where displaced and PTSD prevalence crosstabulation, that the majority displaced to Gaziera state and most of them didn't had PTSD (91).

Figure 6: shows participants time of displaced \* PTSD prevalence crosstabulation (n=666).

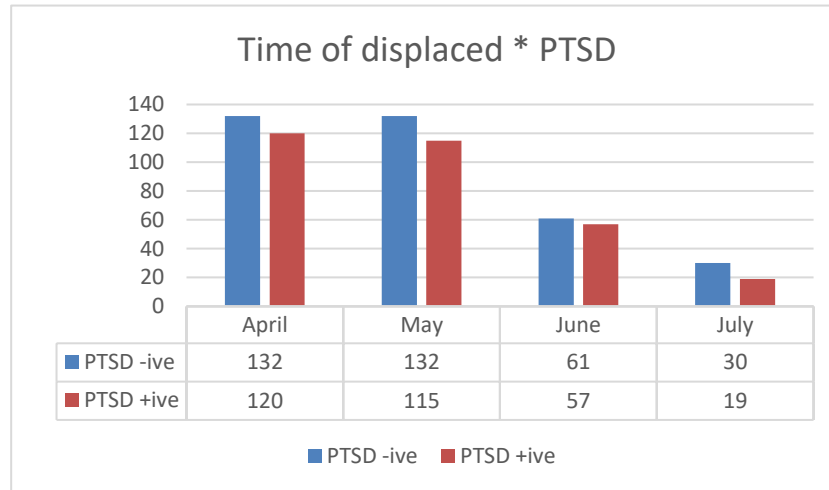


Figure 6 (above) present about time of displaced and PTSD prevalence crosstabulation, that the majority displaced in April and May and the majority of them don't had PTSD (132, 132 respectively)

Table 4 : PTSD and associated sociodemographic characteristics of research participants – bivariate analysis

Crosstabulation	Chi-Square Tests		P value
	Pearson Chi-Square	Likelihood Ratio	
Sex * PTSD	31.566	31.835	< 0.001
Age * PTSD	11.071	11.252	0.010
from where did you displaced * PTSD	4.661	4.661	0.198
To where did you displaced * PTSD	6.839	6.841	0.223
when did you displaced * PTSD	1.446	1.460	0.695

Table 4 (above) presents a bivariate analysis of PTSD and the associated sociodemographic characteristics of the research participants. In this analysis chi-square test of significance was conducted to determine the statistical significance between PTSD and each of the sociodemographic variables. The results in Table 4 indicate that sex and age had a statistically significant association with PTSD, with a p-value of <0.001, 0.010 respectively. In contrast, the results indicate that the variables of from where displaced, to where displaced and time of displaced had no statistically significant association with PTSD (p>0.05) at the baseline.

### Discussion

The findings clearly indicate that PTSD was highly prevalent among internally displaced people featured in the study, with an overall prevalence rate of 46.7%, although the prevalence rate of the people didn't had PTSD is a little more but still near half of people had PTSD is a high number. These findings are therefore comparable to previous studies conducted in developed countries that have showed that people whom had traumatic events tend to be vulnerable to developing PTSD. For example, the results of Roberts et al.[17] in 2009 indicated that over one third (36%) of respondents met symptom criteria for PTSD. In Africa, these findings are lower than Ssenyonga et al. [18] finding, whom conducted a cross-

sectional survey that examined post-traumatic growth, resilience and PTSD among a random sample of 426 Congolese refugees' residents in Nakivale camp. In their study the overall PTSD prevalence rate was 61.7%, which was higher than the findings in this study, we think that due to different instruments and methods were used. The present study's findings were similar to a study of Karunakara et al. [19], who recorded PTSD rates of 46% among refugees from southern Sudan living in Uganda and 48% among residents in southern Sudan. Also, a little lower PTSD rates of 39.9% were showed by Musisi [20] among survivors of conflict. The findings by Mugisha et al. [21] also indicated a lower PTSD prevalence rate of 11.8 % in northern Uganda, with a prevalence rate of 10.9 % and 13.4 % among female and male respondents respectively.

The present study has found PTSD prevalence rates of 57.3% and 35.6% among male and female respondents respectively. These findings shows some similar and some difference to the findings of Neuner et al.[22] which founded that among Ugandan and Sudanese refugees in the west Nile region, 31.6% of male respondents and 40.1% of female respondents had PTSD.

In the present study, the findings reveal that male sex and small age of 18 - 25 years variables were a predictor for PTSD development and had significant relationship to it, this was difference to the findings of Ssenyonga et al.[18], which showed that being a female was significant predictors of PTSD.

## Conclusion

It is clear that near half of Sudan war survivors from Khartoum state had been affected by PTSD. The results from this study provide vital insights into trauma and mental health. Also, the result showed that traumatic experiences can have adverse effects that affected internally displaced people whom survive from the war and affect their ability to recover and rebuild their lives. The research only showed the PTSD rates among the research participants and this can be only a proportion of the mental health that internally displaced people had. These results were given to the government to adequately plan for and programme mental health interventions for internally displaced people. Also, the government must do a future research with huge sample size and with screening to another mental illness to support survivors and give them good interventions and proper treatment.

## Acknowledgments

Benjamin Franklin once said:

“An investment in knowledge pays the best interest.”

We want to thank everyone who supported us in delivering this research, we sincerely think that we couldn't accomplish this paper without the complete support & help from our loved ones, specially our families, the ones who stood by us all along the way, cheering, complimenting and advising us on how we need to complete this work, telling us “not to quit when we're tired but to quit when we're done”.

We hope that you see our efforts worth your full and non-dividing attention.

## Ethical Consideration

The participant was informed about all details of the research by informed content form in the questionnaire and the permission was obtained as verbal consent from the research participants, the response was kept completely confidential and used for purpose of research only.

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## Conflicts of Interest

The authors declare that they have no competing interests.

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