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Research Article

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Prevalence and Sociodemographic Characteristics of Post-Traumatic Stress Disorder in Adult Trauma Patients in A Ugandan Referral Hospital

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Abstract

Background: *Attempts to ensure total care of the trauma patient in order to reduce morbidity and mortality, has led to a drift of global concern towards the psychiatric sequelae of trauma patients. Psychiatric disorders following trauma are common with one of the commonest being post- traumatic stress disorder (PTSD) and are associated with poor functional and occupational outcomes. In African settings, there is scarcity of data regarding the prevalence and sociodemographic characteristics of PTSD in trauma patients.*

Aim of Study: *To determine the prevalence and sociodemographic characteristics of post- traumatic stress disorder in adult orthopaedic trauma patients seen in a referral hospital in Uganda.*

Methods: *This was a hospital based quantitative cross-sectional descriptive study of adult orthopaedic trauma patients at Mulago hospital. A structured questionnaire containing sociodemographic characteristics and module for PTSD diagnosis in Diagnostic and Statistical Manual Fourth Edition Text Revised (DSM-IV-TR) was administered to consenting patients who met the inclusion criteria by systematic random sampling. Data was entered in Epi Data software and exported to STATA 10.0 for descriptive bivariate analysis using Mantel Haenszel method.*

Results: *Two hundred and ninety-seven (297) patients were recruited into the study of which the period prevalence of PTSD in adult orthopaedic trauma patients seen at Mulago hospital was 17.85% (53/297). The Mean age was 37.06(±14.61) with majority of participants between the ages of 18 to 29years (37.04%).Males 66.33% (197/297) and females 33.67% (100/297). The educational level of majority of these participants was primary/secondary 74.07% (220/297). Most of the participants were self-employed 52.53% (156/297) and 80.81% (240/297) of participants had an income level of less than one million Ugandan shillings (397dollars) a year.*

Conclusion: *The 6-months prevalence of PTSD in adult orthopaedic trauma patients was 17.85%. Also, female sex, older age group over 40 years, divorced, widow/widower, government or private employment and a low-income level had a higher risk of PTSD following trauma. The need for a multi-disciplinary approach to the management of the trauma patient involving a clinical psychologist or a psychiatrist will be very vital for a better outcome.*

Keywords: Road Traffic Accidents, Motto Vehicle Accident, Post Traumatic Stress Disorder, Prevalence, Uganda

Introduction

In recent times, a bid to ensure total care of the trauma patient in order to reduce morbidity and mortality, has led to a drift of global concern towards the psychiatric aspects and sequelae of trauma patients [1,2]. Psychiatric disorders following trauma are common with one of the commonest being post- traumatic stress disorder (PTSD) associated with poor functional and occupational outcomes [5-7].

In the United States of America, a study found that motor vehicle accidents (MVA) were the single leading cause of PTSD in the general population [1].

A review of psychiatric morbidity after motor vehicle collisions

found the most commonly reported disorders were depression (21% to 67%), anxiety (4% to 87%), driving phobia (2% to 47%) and PTSD (0% to 100% across studies) [8]. Another systematic review reported rates of PTSD ranging across studies from 2-30%, depression from 6- 42%, with up to half of those with PTSD also having co- morbid depression; anxiety disorders were reported to range from 4-24%, with up to 60% of those with PTSD also having co-morbid anxiety disorders [9]. This clearly indicates the central placement of PTSD as common psychiatric sequelae following most trauma patients visa vis other conditions.

According to DSM-IV-TR, PTSD can occur when an individual has been exposed to a traumatic event in which the person experienced, witnessed or was confronted with a potentially life-threatening event to self or others, and the person responded with intense fear, helplessness or horror [10]. Symptoms include, re-experiencing the event (intrusive memories or nightmares), avoiding stimuli associated with the trauma, numbing of general responsiveness and hyper arousal. Majority of patients who experience traumatic events like military combat, violent personal assault (sexual and physical attack), motor vehicle accidents, falls, will have some of these symptoms within days or weeks after the traumatic event, but PTSD is not diagnosed until symptoms last at least one month. According to DSM – IV.TR Three types are recognized, acute within 1- 3 months, chronic 3 to more months and delayed onset of symptoms occur 6 months after the traumatic event [10].

PTSD in orthopaedic trauma patients causes psychiatric/ psychological problems for patients ranging from depression, anxiety, pain or sleep problems that may be more challenging than their orthopaedic trauma. This can affect their treatment to an extent that the patient may not have the inherent incentive to maintain healing or participate in rehabilitative therapy [11].

The life time prevalence of PTSD is estimated to be 8% in the general population of the United State(10). Despite the varied prevalence of PTSD in orthopaedic trauma patients in High Income Countires (HIC), little is known of the prevalence in Low and Middle income countries (LMIC) .

Despite the increasing burden of trauma in Uganda, little is however known about the psychiatric sequelae specifically PTSD in orthopaedic trauma patients. The aim of this study was to determine the prevalence of PTSD in adult Orthopaedic trauma patients attending the outpatient clinic in Mulago Hospital, Uganda during a six-month period of study.

Conceptual Framework

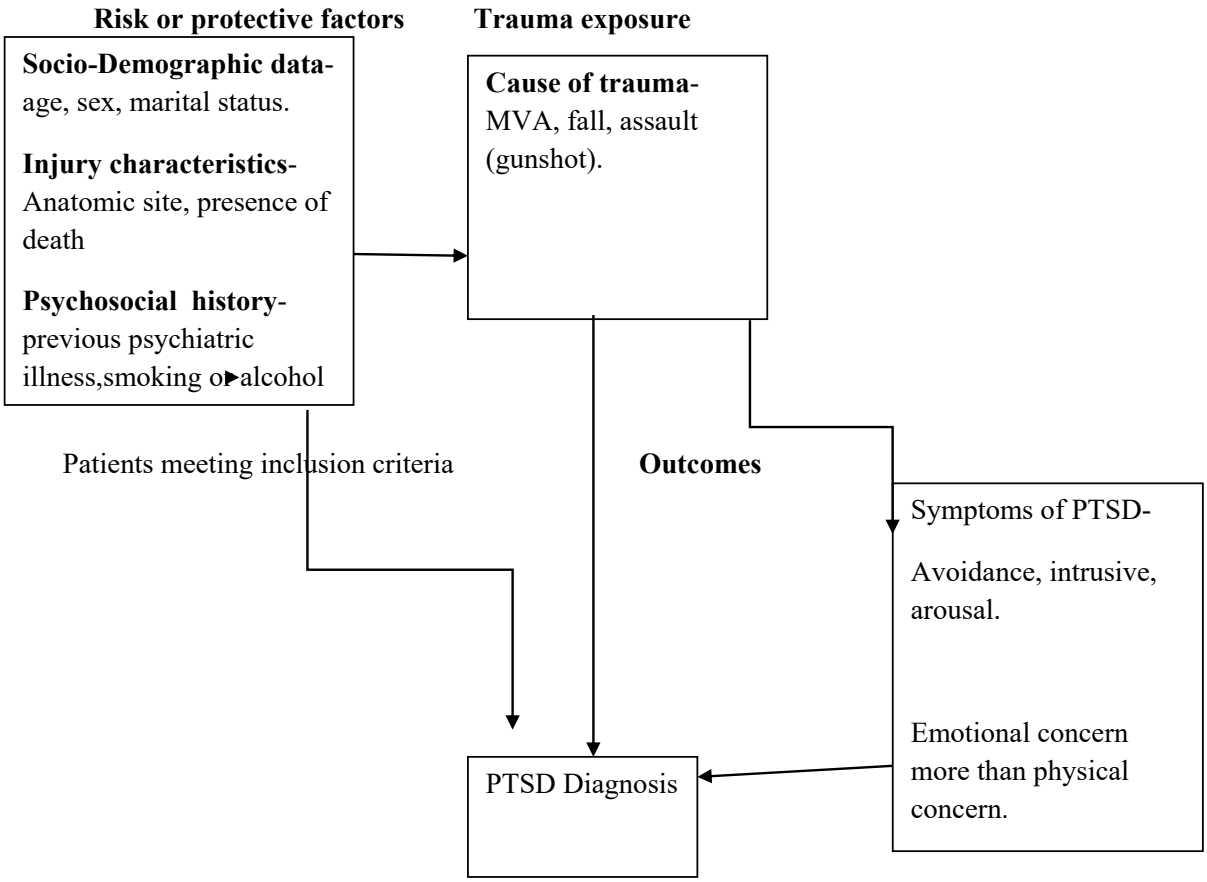


Figure 1: Conceptual framework.

Methodology

Study design and setting

This was a hospital-based quantitative cross-sectional descriptive study, conducted at the Orthopaedic outpatient clinic of the Mulago National Referral and Teaching Hospital of Makerere University. This hospital has over 1500 bed capacity and is located in Kampala about 4.9km from the city Centre. The Orthopaedic out patient's clinic is run every Friday. During the time of the study, the clinic received both old and new patients of the department of orthopaedic surgery, an average of about 160 patients on each clinic day with about 80 being patients with traumatic injuries like fractures, dislocations, and ligamentous injuries.

Study population

The study population included all adult (18 years and above) orthopaedic patients attending the out-patient clinic who met the inclusion criteria of the study.

Study period

The study was conducted within a period of 6 months (24 weeks) from April to September 2013.

Selection criteria

The study included all adult orthopaedic trauma patients who attended the out-patients clinic and where above18 years, consented, was involved in a life threatening orthopaedic trauma like RTA, fall from height, assault etc and should have experienced the injury over one month prior to the study.

A patient whose Glasgow coma score was less than 15 or had amnesia or one who was recruited during a previous visit to the clinic were excluded.

Sample size

The formula for determining sample of a single proportion was used. The formula derived by Wayne W. Daniel

$n = NZ^2P(1-P) / d2(N-1) + Z2P(1-P)$

n=sample size

N= Number of patients with orthopaedic trauma attending out-patient clinic

Z= z value corresponding to the confidence level

d=absolute precision

P=expected proportion of the characteristics to be measured

N= Number of patients with orthopaedic trauma attending clinic weekly is 80, for a period of 3 months 960

The confidence level is 95% giving a z value of 1.96

The absolute precision (d) or expected error has been put at 5%

The expected proportion (P) in the characteristics of interest was the average of the prevalence in the pilot study in Mulago and the prevalence in the Kenya study i.e 28% +13.3%/2=0.413

n= 960x1.96x1.96x0.413 (1-0.413)/ 0.05x0.05 (960-1) +1.96x1.96x0.413 (1-0.413) =269.53=270. 10% of this number. (ie 27) was added to cater for inappropriate response, invalid questionnaire or missing questionnaire.

Total sample size =270 + 27= **297**.

Sampling Method

Systematic random sampling was used in the study. Given that averagely 160 patients attended the clinic weekly, 640 and 1920 patients were expected in a month and 3 months respectively. The estimated sample size was 270 therefore the nth number is 1920/270=7.11 approximated to 7. Therefore every 7th patient at the clinic who met the inclusion criteria was interviewed.

Study procedure

The study was carried out by administering a structured questionnaire in the form of an interview. The questions included socio- demographic data of patient and symptoms of PTSD as per the diagnostic statistical manual IV(DSM-IV-TR) of PTSD, history of psychiatric illness in participant or family. Patients who satisfied the criteria for PTSD diagnosis according to DSM-IV-TR diagnostic criteria by having at least one or more intrusion symptoms, three or more avoidance symptoms and two or more arousal symptoms were referred to the Mulago Mental Health clinic for further evaluation and treatment.

Study variables

The study involved the following independent variables; Socio-demographics, cause of injury-MVA, fall, assault, occupational hazard, gunshot, anatomic site-upper limb, lower limb, pelvis, spine, severity of injury, duration of injury, presence or absence of death, history of smoking, history of alcohol consumption, previous psychiatric illness.

The dependent variables were presence of PTSD.

Data collection

A structured preceded and pretested questionnaire was administered by the principal investigator and three research assistants; an orthopaedic resident and two psychiatric nurses at the orthopaedic out- patient clinic. Each completed questionnaire was evaluated by the principal investigator or sometimes by the orthopaedic resident and all patients with the diagnosis of PTSD using the DSM-IV referred to the Mulago Mental Health clinic for further evaluation and treatment.

Data entry and analysis

The completed questionnaires were checked for completeness and was entered into a computer EPI-DATA software version 3.1 and exported to STATA version 10.1 (copyright 1985-2011 Stata Corp LP, Texas, USA) for analysis with the help of a medical statistician. The socio-demographic variables were presented in tables and graphs where applicable. Univariate, bivariate analysis of the variables was done by the Mantel haenszel chi-square method. Using means, proportions, frequencies, percentages and level of significance by odds ratios and p-values. The prevalence of PTSD was calculated with the numerator being the number of patients diagnosed and the denominator, the number of orthopaedic trauma patients who met the inclusion criteria and enrolled in the study, presented in tabular form with percentages.

Ethical consideration

The research was carried out based on the principles of respect, confidentiality and beneficence with regards to the patients.

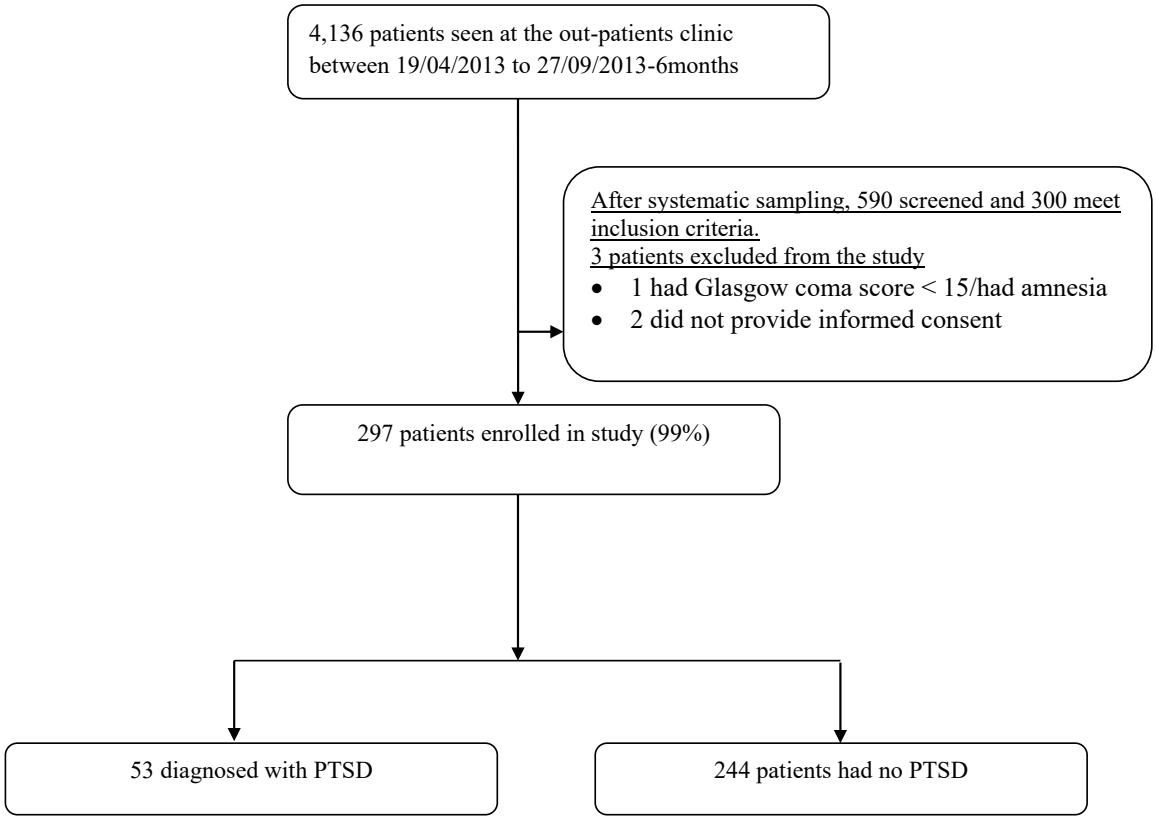
Permission and ethical clearance were obtained from the Ethics and Research Committee of Mulago National Referral Hospital and the Institutional Review Board of Makerere University as a thesis for MMED Orthopaedic Surgery.

Study limitations

The fact that this was a cross-sectional descriptive study limits the discovery of a cause and effect relationship in studied variables. Findings can only be generalized to similar study populations only

Results

Study profile



Characteristic	**Participant distribution** N= 297	
	Number	Percentage(%)
Age group in years		
1. 18-29	110	37.04
2. 30-41	96	32.32
3. 42-53	48	16.16
4. 54-65	26	8.75
5. 66-77	12	4.04
6. >77	5	1.68
Gender		
Male	197	66.33
Female	100	33.67

Education level		
Illiterate(can't read and write)	25	8.42
Primary/Secondary	220	74.07
University/College	52	17.51
Marital status		
Married/Co-habiting)	170	57.24
Single	93	31.31
Divorced	18	6.06
Widow/Widower	16	5.39
Employment status		
Unemployed	71	23.91
Self-employed	156	52.53
Government	17	5.72
Private employed	53	17.85
Income level (Million shillings)		
One(397 dollars)	240	80.81
One to five	52	17.51
> five	5	1.68

Table 1: Distribution of Socio-demographic characteristics of study participants

The Mean age of the study participants was 37.06(14.61) with majority of participants between the ages of 18 to 29years (37.04%).

Males 66.33% (197/297) and females 33.67% (100/297). The educational level of majority of these participants was primary/ secondary 74.07% (220/297). Most of the participants were self-employed 52.53% (156/297) and 80.81% (240/297) of participants had an income level of less than one million Ugandan shillings (397dollars) a year. Participant with prior orthopaedic trauma were 66.55% (197/297).

	Participants, N=297	
	Number	Percentage(95%CI)
Presence of PTSD	53	**17.85**(13.47-22.22)

Table 2: Prevalence of Post-traumatic stress disorder

Prevalence of PTSD among adult orthopaedic trauma patients at the out- patient clinic within a period of 6 months was **17.85 %**.

Risk factor	Post-traumatic Stress Disorder			
	No N=244	Yes N=53		
Socio-Demographic factors	**Number (%)**	**Number (%)**	**OR(95%CI)**	**p-value**
Age group in years				
1. 18-29	94(38.52)	16(30.19)	Reference	
2. 30-41	77(31.56)	19(35.85)	1.45(0.70-3.01)	0.319
3. 42-53	38(15.57)	10(18.87)	1.55(0.64-3.71)	0.329
4. 54-65	21(8.61)	5(9.43)	1.40(0.46-4.24)	0.553
5. 66-77	10(4.10)	2(3.77)	1.18(0.24-5.87)	0.844
6. >77	4(1.64)	1(1.89)	1.47(0.15-14.00)	0.738
Gender				
Male	166(68.03)	31(58.49)	Reference	
Female	78(31.97)	22(41.51)	1.51(0.82-2.78)	0.183
Education level				
Illiterate	18(7.38)	7(13.21)	Reference	
Primary/Secondary	182(74.59)	38(71.70)	0.54(0.21-1.38)	0.195
University/College	44(18.03)	8(15.09)	0.47(0.15-1.48)	0.196
Marital status				
Married/Co-habiting)	143(58.61)	27(50.94)	Reference	
Single	76(31.15)	17(32.08)	1.18(0.61-2.31)	0.619
Divorced	14(5.74)	4(7.55)	1.51(0.46-4.95)	0.493
Widow/Widower	11(4.51)	5(9.43)	2.41(0.77-7.48)	0.129
Employment status				
Unemployed	58(23.77)	13(24.53)	Reference	
Self-employed	132(54.10)	24(45.28)	0.81(0.39-1.70)	0.581
Government	13(5.33)	4(7.55)	1.37(0.38-4.90)	0.625
Private employed	41(16.80)	12(22.64)	1.31(0.54-3.15)	0.553
Income level (Million)				
One	194(79.51)	46(86.79)	Reference	
One to five	46(18.85)	6(11.32)	0.55(0.22-1.37)	0.198
> five	4(1.64)	1(1.89)	1.05(0.12-9.66)	0.963

Table 3: Bivariate analysis of sociodemographic factors and PTSD

Majority of the participants with PTSD 66.04 %(35/53) were in the age group of 18-41 years. However, the odds of developing PTSD as one ages showed an increased trend compared to the younger age group of 18-29 years but this was not statistically significant.

The mean age of those with PTSD was 37.89 (14.71) and those without PTSD 36.88(14.62) a mean difference of 1.01, p-value (0.649) not statistically significant.

The odds of developing PTSD in females was a 51% more compared to the odds in males but was however not statistically significant, OR 1.51(0.82-2.78) ,p-value(0.183).

The association of PTSD and educational level was pointing more towards a decrease in odds as one attains a higher educational level but was not statistically significant for primary/secondary, university/college education compared with illiteracy, OR, 0.54(0.21-1.38),0.47(0.15-1.48) respectively.

Study participants who were married before/ after injury were found to have lower odds of PTSD prevalence compared to those who were single (18% more), divorced (51%more) or widow/ widower (2 times more) before / after injury but this was not statistically significant with OR of 1.18(0.61-2.31), 1.51(0.46-4.95), 2.41(0.77-7.48) respectively.

The trend of association of employment status and PTSD was such that, those who were self-employed before/after injury had a 19% reduction in the odds of prevalence of PTSD than those who were government employees (37%more) or privately employed (31% more) compared to the odds of PTSD in the unemployed participants before and after injury with OR of 0.81(0.39-1.70), 1.37(0.38-4.90), 1.31(0.54-3.15) respectively but this was not statistically significant.

Discussion

Prevalence of post-traumatic stress disorder (PTSD)

In Africa, not much is known about PTSD in orthopaedic trauma patients and there is a paucity of data in this regard.

The prevalence of PTSD in adult orthopaedic trauma patients in this study was 17.85% which is comparable to the prevalence of PTSD of 13.3% among motor MVA survivors in Kenya. However, the study in Kenya was skewed towards only survivors of MVA neglecting other orthopaedic trauma victims that were included in our study which probably could have accounted for the difference. This also agrees with prevalence of PTSD in studies done in middle income and developed countries [12-15]. However, a study in Nigeria documented a prevalence of 26.7% among road traffic accident victims which is slightly higher than in other African countries [17]. This could have been due to the smaller sample size (151) and also the study included only road traffic accident victims and no other forms of trauma as was the case in our study.

The increasing trends of the prevalence of PTSD in our orthopaedic trauma patients calls for the creation of the awareness of this condition in our trauma patients and doctors treating these patients must have a high index of suspicion to make the diagnosis and refer patients for treatment. Also, there is the need to identify possible factors that can predispose patients to developing this condition for early intervention. This therefore calls for a multi-disciplinary approach to the management of a trauma patient with the involvement of a Psychiatrist or a clinical Psychologist.

Age and Sex

Majority of the participants with PTSD 66.04 %(35/53) were in the age group of 18-41 years which is comparable to other studies in which the younger age group had more PTSD [12-18]. However, the odds of developing PTSD as one ages was over 30% more compared to the younger age group of 18-29 years but this was not statistically significant. This is similar to what was found in Nigeria however a study in Iran did not find any association [15,17]. However, others found that there was an increased likelihood of older individuals developing PTSD as compared to younger individuals [2,19]. This variation in literature regarding association of PTSD and age could be due to the differences in the sample populations. Also, in most African countries majority of the younger age groups are involved in traumatic situations leading to motor vehicle accidents accounting for the higher proportion in the younger age group than the elderly. However, the odds of developing PTSD following trauma appears to be more likely in the older age group probably due to repeated exposure to trauma situations resulting in more stress reactions [2].

In this study even though the number of male participants was more than twice that of female participants, the prevalence of PTSD in females was 41.5 %(22/53) and males 58.5%(31/53) and the odds of developing PTSD in females was 51% more compared to the males but was however not statistically significant. This finding is consistent with others studies in literature [12,18,20-22]. This observation has been attributed to the differences in the way men and women respond to danger and express distress in similar trauma situations such that women use more dissociative defense mechanisms than men which gives rise to the increase prevalence of PTSD [23,24].

Marital status

In this study it was found that Married participants before/ after injury were found to have lower prevalence of PTSD compared to those who were single (18% more), divorced (51%more) or widow/widower (2 times more) before / after injury but this was not statistically significant.

This finding is similar to studies found in Spain among MVA survivors, and in the general population of South Africa and the rest [18,25,26].This finding however disagrees with a study that was done in Kenya where the prevalence of PTSD was higher among the married than the previously married or unmarried [12]. These variations are expected in that psychosocial support in married persons varies from place to place and could either be positive or negative and in the case of a previously married person, stress from the circumstances surrounding separation or death of a partner could influence the presence or absence of PTSD as well as the gender variations of participants.

Employment status

In this study it was found that the likelihood of PTSD among patients who were gainfully employed before and after orthopaedic trauma (i.e. Government or privately employed) was over 30% more than those who were unemployed but was reduced by 19% among the self-employed. Also, it was found that Patients who had an annual income of more that 5 million Ugandan Shillings (about 2000 US dollars) had slightly higher odds of developing PTSD.

However, these findings were not statistically significant. This finding compares to other studies that found a positive association between loss of job and development of PTSD following accidents [17,25]. This could be as a result of the fear of disruption of business and loss of finances or loss of one's job after an orthopaedic trauma more so among those who were either privately employed or employed by Government as compared

to the self-employed. Also post- trauma factors like financial difficulties have been found to be independently associated with development of PTSD more so in Sub-Saharan Africa where there is poverty and most likely high dependency ratio and low patronage or limited availability of health insurance [27].

Despite the relatively high prevalence of PTSD found in this study, there is however no documented lifetime prevalence of PTSD in the general population in Uganda. However, a study done in Northern Uganda amongst the internally displaced ,the prevalence of PTSD was 54% which is among the highest globally [28]. Lifetime prevalence of PTSD in South Africa is 2.3%, 7.4% in Europeans and 6.8% in North Americans [26]. These variations in prevalence of PTSD in different population groups could be as a result of the different experiences of people in different situations as well as in different countries and differences in coping mechanisms to traumatic situations across continents. Variability in PTSD prevalence estimates worldwide could also be explained by different sampling strategies, measurement methods, inclusion and measurement of DSM-IV clinically significant impairment criterion, timing and latency of assessment and potential for recall bias [29].

Conclusions

The 6-months prevalence of PTSD in adult orthopaedic trauma patients attending the out-patients clinic of Mulago hospital was 17.85% meaning that the presence of this problem in our trauma patients is significant and has clinical relevance to management of the patients. Also, female sex, the older age group over 40 years, divorced, widow/widower, government or private employment and a low-income level had a higher tendency of PTSD following trauma. The need of a multi-disciplinary approach to the management of the trauma patient involving a clinical psychologist or a psychiatrist will be very vital for a better outcome. Further studies to identify injury characteristics and psychosocial factors role in the development of PTSD trauma patients will be very insightful.

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