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CHARACTERISATION OF TRAUMATISED PERMANENT ANTERIOR TEETH FOLLOWING INTERPERSONAL VIOLENCE.

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ABSTRACT

Introduction: An increase in violence has been suggested to contribute to the occurrence of traumatic dental injuries, hence this study characterised traumatic dental injuries occasioned by interpersonal violence.

Methodology: This was a prospective cross-sectional study of patients who presented with traumatic dental injury occasioned by interpersonal violence. Data was collected via an interviewer-administered questionnaire which garnered information on the socio-demographic characteristics of the participants, history of the traumatic incident, and clinical examination. All data collated were subjected to statistical analysis using the IBM SPSS version 21.0 software.

Results: A total of 60 patients were recruited for the study. The mean age of the participants was 26.73 ± 11.57 years with the majority (56.7%) being in their 3rd and 4th decade of life. There was a male preponderance (58.3%) and single participants made up 68.3%. More than half (58.3%) of the respondents stated that the traumatic incident was occasioned by domestic violence/physical abuse while 33.3% of the respondents were involved in fights/physical altercations. A higher proportion of males were involved in fights and physical altercations while more female respondents suffered domestic violence/physical abuse ($P=0.004$). There

was an increase in the proportion of respondents involved in fights and physical altercations with increasing age and a decrease in the proportion of respondents who suffered domestic violence/physical abuse with increasing age ($p=0.05$).

Conclusion: Variation exists in the cause of interpersonal violence with gender and age. Males and increasing age tend to be associated with fights and physical altercations while females and younger age groups suffer domestic violence/physical abuse.

Keywords: interpersonal violence, dental trauma, anterior teeth

INTRODUCTION

Violence and accidents are sources of great damage to the physical and mental health of different populations, becoming a serious public health issue worldwide [1]. Violence has been defined as the intentional use of physical force or power, threatened or actual, against oneself, another person, or a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation [2]. It has been reported to affect both victims and society at large [1] with the increase in violence suggested to contribute to the occurrence of traumatic dental injury which has been regarded as a public health problem [4]. Interpersonal violence has been observed as a violent strike principally to the face as this is the

most easily reached part of the human body [5].

Traumatic dental injuries are associated with violence [1,3,6] with it being implicated in traumatized anterior teeth among young adults [7,8]. It has been reported that as high as 19.0% of TDI is related to violence with the male gender and those aged between 20 and 29 years of age being most affected [6]. Other studies reported a prevalence of 5.7-8.0% [8-12].

Hashemi and Beshkar [13] reported that domestic violence, a deliberate often repetitive, physical abuse by one family member against another, (marital partners, parents, children, siblings, or any other member of a household) was a significant cause of traumatized anterior teeth. Leathers and colleagues [14,15] reported orofacial injury profiles in an inner-city hospital and an underserved minority population. They found that most traumatized anterior teeth resulted from intentional violence, and the victims were primarily socially and economically disadvantaged groups in the minority populations.

Intraoral and perioral trauma can result from a variety of injury mechanisms with visual assessment, a brief physical examination, and palpation for asymmetries of the face and exposed skin identifying possible interpersonal violence events [16]. The identification of groups at risk as well as the evaluation of treatment needs regarding TDI associated with interpersonal violence is important for the development of preventive and clinical protocols for these cases. Furthermore, the impact of nonfatal violence cannot be measured, but it is even more malign given the resultant disabilities and long-standing physical, psychological, economic, and social consequences [17]. Also, it has been advocated that future research should be focused on developing and implementing system changes to improve care for

persons who have suffered interpersonal violence [18].

The oral cavity is thought to be an under-investigated area concerning interpersonal violence [16] with various effects of interpersonal violence reported [17]. However, there is a lack of studies on the effect of interpersonal violence on the anterior teeth. Hence, this study sought to characterize traumatic dental injuries to the permanent anterior teeth occasioned by interpersonal violence

METHOD

This was a prospective cross-sectional study of patients who presented with traumatic dental injury involving the anterior teeth occasioned by interpersonal violence as defined by the World Report on Violence and Health as violence between individuals and is subdivided into *family and intimate partner violence* and *community violence*. The former category includes child maltreatment; intimate partner violence; and elder abuse, while the latter is broken down into *acquaintance* and *stranger* violence and includes youth violence; assault by strangers; violence related to property crimes; and violence in workplaces and other institutions [2]. The data collection instrument was an interviewer-administered questionnaire consisting of 3 sections: socio-demographic data (age, gender, occupation, educational status), presenting complaint and history of the traumatic incident (when, where, and how), and clinical examination. Crowns of all anterior teeth were examined for signs of trauma. Where present, the extent, and type of injury were classified using the Ellis classification [19].

All data collated were subjected to statistical analysis using the IBM SPSS version 26.0 software. The data was subjected to descriptive statistics in the form of mean, standard deviation, and frequency. The chi-square test was used to

determine associations between variables with statistical significance set at a P value of < 0.05 . The results obtained were presented in the form of tables and figures.

RESULTS

A total of 60 patients with a history of traumatic incidents due to interpersonal violence were recruited for the study. The mean age of the participants was 26.73 ± 11.57 years with ages ranging from 6 years to 59 years and the majority (56.7%) being in their 3rd and 4th decade of life. There was a male preponderance (58.3%) with a male-female ratio of 1:0.71 and single participants made up 68.3% of the study population. Dependents accounted for 53.3% of the study population while those with tertiary education made up 58.3% (Table 1).

The number of traumatized anterior among the respondents ranged from 1-6 with a mean of 2.20 ± 1.7 teeth. A total of 132 anterior teeth were noted to have been traumatized. The distribution of the teeth traumatized is shown in Table 2. The central incisors were the most frequently traumatized teeth accounting for 75.0%. Furthermore, 61.7% of the respondents presented with multiple traumatized while the remaining 38.3% presented with a single traumatized tooth. The majority (96.7%) of the respondents had at least one traumatized tooth in the maxillary arch while 26.7% had at least a traumatized tooth in the mandibular arch.

Figure 1 depicts the etiology of the traumatic incident. More than half (58.3%) of the respondents had their traumatic incident occasioned by domestic violence/physical abuse while 33.3% of the respondents were involved in fights/physical altercations.

The extent of injury as classified using the Ellis classification ranged from simple crown fracture with plain enamel involvement to cervical crown fracture.

The most frequently encountered injury was tooth luxation without crown or root fracture accounting for 25.0%, followed by traumatic tooth avulsion (22.0%) and extended crown fracture with noticeable dentinal involvement with pulp exposure (14.4%). The least injury represented was cervical crown fracture (2.3%) and simple crown fracture with plain enamel involvement accounting for 4.5% of the injuries (Table 3).

Table 4 depicts a statistically significant association between the gender of the respondent and the etiology of the traumatic incident. A higher proportion of males were involved in fights and physical altercations compared to their female counterparts. On the other hand, female respondents suffered domestic violence/physical abuse more than male respondents ($P=0.004$). There was an increase in the proportion of respondents involved in fights and physical altercations with increasing age and a decrease in the proportion of respondents who suffered domestic violence/physical abuse with increasing age and this was statistically significant ($p=0.05$).

Level of education was significantly related to the number of traumatized teeth ($p=0.011$) with a higher proportion of those who had attained primary and secondary education having multiple traumatized teeth and more of those with tertiary education having single tooth involvement (Table 5).

DISCUSSION

Interpersonal violence is associated with loss of productivity and increased use of health care and social services, even long after the end of the violent episodes [20,21]. Studies on abused populations have shown that the head and neck are the most commonly injured parts of the body,

with subsequent fractures, contusions, burns, and traumatic dental injuries [22,23]. The mean age of the participants is close to the mean age of victims in a study on domestic violence [1]. In studies on dental trauma, violence was observed to be associated with young adults between the ages of 20 and 40 years [6,8], which is the most active age of an individual.

A male preponderance was observed in this study. A finding reported in previous studies on dental trauma where more males were observed to suffer dental trauma following interpersonal violence [6,24,25] but in contrast to other studies where the majority of victims were women [1,26]. This difference is because these contrasting studies were specifically on domestic violence.

Multiple teeth were traumatised showing that the effect of violence on the teeth should not be underestimated. The central incisors were the most frequently traumatized teeth a finding similar to previous studies [1,27]. This is not surprising as the most injured area of the head and neck in violent cases are the maxilla [28] and middle third of the face [29].

The pattern of injury observed in this study was similar to that observed in previous studies [1,3]. Fracture or loosening of teeth was noted in this study and has been reported in previous studies [1,27,29]. Also, tooth avulsion was observed in this study corroborating previous reports of tooth avulsion associated with interpersonal violence [1,3,27].

Domestic violence has been recognized as an utmost important public health and human rights problem today [30]. A higher prevalence of domestic violence/physical abuse was observed in this study. A finding contrary to previous studies that reported a higher prevalence of urban violence [1].

Gender was observed to have a statistically significant association with the etiology of the traumatic incident, a finding similar to previous reports [1,25]. Males were noted to be associated with urban violence in the form of fights and physical altercation. This is similar to a previous report [4] with females recording more incidences of domestic violence. It has been suggested that domestic violence has a significant effect on the oral health status of women [3].

The ability to defend oneself tends to increase with age hence there was an increase in the proportion of respondents involved in fights and physical altercations with increasing age and a decrease in the proportion of respondents who suffered domestic violence/physical abuse with increasing age.

Multiple affected teeth have been reported to be associated with age and aetiology [31]. However, in this study, the education level was significantly related to the number of traumatised teeth. Low literacy level tends to be a factor associated with violence. It has been shown that quality education promotes understanding, tolerance, and peaceful coexistence among individuals and communities with the potential to reduce the likelihood of conflicts by fostering critical thinking, encouraging open dialogue [32].

Conclusion: Variation exists in the cause of interpersonal violence with gender and age. Males and increasing age tend to be associated with fights and physical altercations while females and younger age groups suffer domestic violence/physical abuse.

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Table 1: Demographic characteristics of the respondents

Characteristics	Frequency	Percent
Gender		
Male	35	58.3
Female	25	41.7
Age Group (years)		
≤ 20	19	31.7
21-40	34	56.7
41-60	7	11.7
Occupation		
Professional	3	5.0
Skilled worker	16	26.7
Semi-skilled worker	3	5.0
Unskilled worker	6	10.0
Dependent	32	53.3
Level of education		
Primary	6	10.0
Secondary	19	31.7
Tertiary	35	58.3
Marital status		
Single	41	68.3
Married	19	31.7
Total	60	100.0

Table 2: Distribution of the traumatised anterior teeth

Teeth type	Frequency	Percent
Central incisor	99	75.0
Lateral incisor	29	22.0
Canine	4	3.0
Total	132	100.0

Table 3: Distribution of injuries to the traumatised teeth

Injury	Frequency	Percent
Simple crown fracture with plain enamel involvement	6	4.5
Extended crown fracture with noticeable dentinal involvement	15	11.4

without pulp exposure		
Extended crown fracture with noticeable dentinal involvement with pulp exposure	19	14.4
Teeth that have lost their vitality, with or without loss of crown tissues	18	13.6
Traumatically avulsed tooth	29	22.0
Root fracture with or without the loss of crown tissues	9	6.8
Tooth luxation without crown or root fracture	33	25.0
Cervical crown fracture	3	2.3
Total	132	100.0

Table 4: Association between gender, age-group and aetiology of the traumatic incident

Characteristics	Aetiology			Total n (%)
	Fights/physical altercations n (%)	Domestic violence/physical abuse n (%)	Assault n (%)	
Age group (years)				P=0.05
≤ 20	3 (15.8)	16 (84.2)	0 (0.0)	19 (100.0)
21-40	13 (38.2)	17 (50.0)	4 (11.8)	34 (100.0)
41-60	4 (57.1)	2 (28.6)	1 (14.3)	7 (100.0)
Gender				P=0.004
Male	16 (45.7)	19 (54.3)	0 (0.0)	35 (100.0)
Female	4 (16.0)	16 (64.0)	5 (20.0)	25 (100.0)
Total	20 (33.4)	35 (58.3)	5 (8.3)	60 (100.0)

Table 5: Association between demographics and number of traumatised teeth

Characteristics	Number of traumatised teeth		Total n (%)
	Single tooth n (%)	Multiple teeth n (%)	
Gender			P=0.45
Male	12 (34.3)	23 (65.7)	35 (100.0)
Female	11 (44.0)	14 (56.0)	25 (100.0)
Level of education			P=0.011
Primary	1 (16.7)	5 (88.3)	6 (100.0)
Secondary	3 (15.8)	16 (84.2)	19 (100.0)
Tertiary	19 (54.3)	16 (45.7)	35 (100.0)
Age group (years)			P=0.86
≤ 20	8 (42.1)	11 (57.9)	19 (100.0)
21-40	12 (35.3)	22 (64.7)	34 (100.0)
41-60	3 (42.9)	4 (57.1)	7 (100.0)
Total	23 (38.3)	37 (61.7)	60 (100.0)

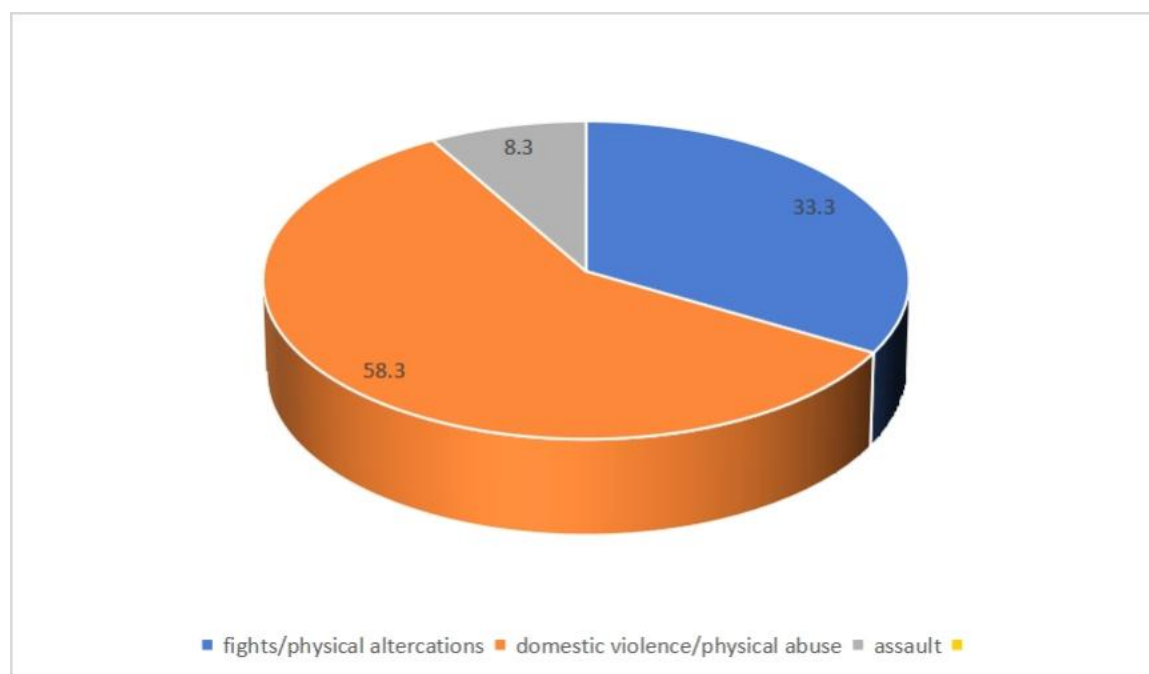


Figure 1: Aetiology of the traumatic incident