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Factors Associated with Interpersonal Violence Injuries as Seen at Kigali and Butare University Teaching Hospitals In Rwanda

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Background: ***Interpersonal conflicts often result into physical injuries of different magnitudes. Every year, a significant portion of patients admitted with injuries to the Accident and Emergency units of the hospitals in Rwanda, like in other African countries, are victims of intentional interpersonal violence. Globally, studies indicate that the problem of interpersonal violence related-injuries is a significant contributor to surgical morbidity and mortality. The aim of this study was to analyze and document the patterns and risk factors associated with interpersonal violence injuries in two referral hospitals in Rwanda (University Teaching Hospitals – Butare (CHUB) and Kigali (CHUK).***
Methods: ***This was a prospective observational study. All patients with interpersonal violence injuries (physical injuries) willing to participate in the study were included. Each participant was assessed using the abbreviated injury sore (AIS), by which we categorized their injuries as minor, moderate, and serious or severe, according to the anatomical distribution and severity of the injuries.***
The variables studied included types of injuries, weapons used, relationship between assailant and victim, and factors leading to the violence. The study population consisted of 138 patients seen from August 2015 to January 2016.
Results: ***Among the 138 participants (victims) the risk factors identified were: Alcohol abuse (31%); Land conflicts (17%); Robbery (14.3%); Business-related / money issues (12.3%); Domestic violence, including child abuse (5.8%); others (2%). Outcome: 119 patients improved well, 17 died and 2 were left with permanent injuries. The total number of trauma cases admitted in the two referral hospitals in this period was 1004, and the trauma mortality for the two hospitals in the same period was 156. This meant a morbidity of 14%, and a mortality of 10% due to interpersonal violence.***
Conclusion: ***The predisposing factors for interpersonal violence in Rwanda, as indicated by this study, included land conflicts, alcohol abuse, robbery, unemployment, domestic violence, and low levels of education. Interpersonal violence injuries contributed significantly to trauma related surgical morbidity and mortality.***

Key words*: Interpersonal violence, Physical injuries, predisposing factors*
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Introduction

The history of trauma parallels the history of the evolution of man, with his aggressive instincts, creative ability and endless ambition to conquer the environment without regard to the price he must pay to achieve his goals[2]. Globally, studies indicate that the problem of interpersonal violence related-injuries is recognized, and is a significant contributor to surgical morbidity and mortality [2, 7, 8].

Rwanda is a beautiful and safe country with a rich cultural heritage, admired worldwide. It has, however, also had turbulent times of severe interpersonal violence. Every year, a significant portion of patients admitted at the Accident and Emergency units of the hospitals in Rwanda, like in other African countries, are victims of intentional interpersonal violence-related injuries.

The true incidence of the injuries resulting from interpersonal violence in Rwanda is unknown. Healthcare practitioners are aware of this burden, but studies have not yet described it. In the accident and emergency departments of CHUK and CHUB, interpersonal violence injuries were among the common causes for consultation and admission. In the surgical wards these injuries accounted for a significant percentage of morbidity and occasional mortality.

While the predisposing factors (or risk factors) of Interpersonal violence injuries were mostly known to be community-based and to some extent preventable, as suggested by several similar studies, there had

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been no study focused on this problem to verify the statistical importance of the various factors associated with it in Rwanda [1, 6, 9].

Every week, the Emergency Departments of referral hospitals in Rwanda received many victims of interpersonal violence. Many of these injuries were fatal, because they involved delicate parts of the body, and often led to significant morbidity and mortality, as well as occasional litigation. Many of the risk factors of these injuries were possibly preventable through community based interventions.

Patients and Methods

This was a Prospective observational study, carried out in two University teaching hospitals of Kigali (CHUK) and Butare (CHUB), between August2015 and January 2016. The victims of interpersonal violence were consecutively received at emergencies, and always went through the initial ATLS assessment protocols as soon as possible. Many patients with minor injuries were discharged after full assessment, with an appointment for outpatient follow up. Those with serious injuries were hospitalized for treatment in accordance with the hospital management protocols.

Included among the study variables were the predisposing (or risk factors), the gender of victims, anatomical distribution of the injuries, age distribution, marital status, the types of injuries, occupation, education level of the victims, the weapons used, the relationships of the people involved in the assault, and the treatment outcomes of these injuries.

The aim of this study was to investigate the patterns of interpersonal violence related to intentional injuries in Rwanda. We recorded the injuries, and determined their anatomic distribution, the mechanisms of injury, factors associated with the physical assault, as well as the treatment modalities, and outcomes of these injuries. Each participant was assessed using the abbreviated injury sore (AIS), by which we categorized their injuries as minor, moderate, and serious or severe, according to the anatomical distribution and severity of the injuries.

Data were collected using a pre-test questionnaire. Each participant or the next of kin (for unconscious patients) enrolled and was assigned one questionnaire. The interviews were confidential, in line with the ethical requirements, in addition to the fact that some of the cases were legally sensitive. Data were analysed using the Statistical Package for Social Sciences SPSS version 16.

Results

During the study period, 1004 cases of trauma were admitted in both hospitals which included 138 (14%) cases of interpersonal violence. The latter contributed to 10% to the trauma mortality In this study, the males were 122 (88.4%), whereas the females were 16 (11.6%). This shows that the males were more affected by injuries related to interpersonal violence ($P < 0.000$). The dominant age brackets were 20-30 at 42%, and 31-40 at 34.8%. This means that the sum of these two age brackets was 76.8%.

Most of the victims had a primary school level of education (68%); 15% had secondary school education; and13% of the victims had never been to school ($P<0.000$). Only 4% of the victims had university level of education ($P< 0.158$). Unemployment affected 43.5% of the participants and peasant farming (39.9%) combined, formed a greater part of the study population. These two give a combined percentage of 83.4%, ($p <0.000$).

Anatomical location of injuries: An Abbreviated injury score (AIS) was allocated to the victim at admission according to the anatomical part of the body injured.

50% of victims were injured on their head and neck while extremities were affected in 29.7%. Chest and abdominal injuries represent 20.3% ($P <0.000$).
Cut wounds represented 37% of injuries; lacerations represented 34%; penetrating injuries 28%. These were the most common injuries sustained by victims.

The weapons used during the assault are shown in Table 2. Wooden sticks were used in 47.8% of all cases followed by knives in 21.7% and machetes in 13.8%. Most incidences of violence occurred at home in

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37% of cases; along the roadside in 35, 5%; and 23.9% in the bar. This does not show any one location as being strongly indicative of increased risk for violence. This indicates that there was no specific place tagged to interpersonal violence injuries. Home violence suggests domestic violence and conflicts with neighbours, whereas in the bar suggests alcohol influence.

Table 1. Age, Education and Gender of the study population

Age	%	Education level	%	Gender	%
20-30	42.0	Primary	68	Male	
31-40	34.8	Secondary	15	112	88.4
41-50	13.0	Tertiary	4	Female	
51-60	8.0	Illiterate	13	16	11.6
61-70	2.2	Total	100		
Total	100.0				

Table 2. Factors associated with Interpersonal violence injuries

Factors	%	Link to Assailant	%	Place	%	Weapon	%	Occupation	%
Alcohol	32.6	Friend	41.3	Home	37.0	Stick	47.8	Jobless	43.5
Land	17.4	Neighbor	37.0	Road	35.5	Knife	21.7	Farmer	39.9
Revenge	15.2	Family Member	14.5	Bar	23.9	Machete	13.8	Business	9.4
Robbery	14.5	husband	5.1	Others	2.2	bottle	11.6	Motor driver	2.2
Money	12.3	Other	1.4	Farm	1.4	Others	4.3	Office Worker	1.4
Domest Violence	5.8	Wife	.7			Gun	.7	Others	1.4
Others	1.4					Total	100.0	Teacher	1.4
Sex-related	7							Student	.7
Total	100.0		100.0		100.0			Total	100.0

With regard to the timing of violence, most (77.5%) of the victims were injured at night. Only 22.5% of the victims were injured during the The darkness of the night is often used for propagation of violent and criminal acts as it conceals identification, and community resistance is often minimal or not present at night. The majority (63%) of the victims involved in interpersonal violence were either married or cohabitating. Single and widowed accounted for 36.2% of the cases. The difference was statistically significant

In 41.3% of victims of interpersonal violence, the assailants were regarded as 'friends'; 37% were injured by their neighbours and 14.5% were injured by their family members. Among the factors that were considered to have le accounted d to the interpersonal violence included alcoholism in 32.6% and land conflicts in 17.4% of the cases. These two factors contributed 50% of all the risks to interpersonal violence identified in this Rwanda study (P<000). The other predisposing factors included revenge (15.2%), robbery (14.5%), monetary issues (12.3%), and domestic violence (5.8%).

The length of hospital stay ranged between 0-3 days for the majority 53.6%; 4-7 days represent 19.6%, 8-11days represent 12.3%, and above 16 days represents 12.3%. Table 3 summarizes the distribution and outcome of trauma in general and interpersonal violence in particular in the two teaching hospitals in Rwanda

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Table 3. Interpersonal Violence injuries versus all trauma patients admitted during the same period in the two hospitals

Trauma cases admitted	CHUK	CHUB	Total
Total No of Trauma cases	661	343	1004
Interpersonal violence cases	80	58	138
Permanent disability	1	1	2
Mortality	11	6	17

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Discussion

Interpersonal violence injuries contribute to surgical trauma worldwide, and the patterns of this violence vary greatly in terms of root causes, weapons used, and populations involved. In this study, the interpersonal injuries were more common among people who knew each other such as friend, neighbour, spouse, family member, other than strangers (P< 0.000).

Regarding the risk factors, 43% of the injuries were among the jobless, followed by 39% among the peasant farmers. This is partly explained by the fact that land is a principal factor, and land conflicts with the neighbours and relatives were a great root cause in this group. In addition, poverty, alcoholism, gambling and frustration were common among the jobless. These risk factors were similar to those reported in similar studies in Tanzania and Ethiopia[1, 9]. Among the business class (9.4%), money issues such as business transactions and loans, plus robbery were the common causative factors.

Anatomically, 49.4% of the injuries involved the head and neck, and tended to often be multiple. This suggests the lethal intentions of the assailants. The injuries involving extremities would explain the defensive tendencies of the victims. The injuries involving the chest and abdomen, often penetrating injuries, accounted for serious morbidity compared to those of head and neck, because of the complications they often caused such as pneumothorax, bleeding, and infection.

The injuries in this study involved mainly soft tissues, were anatomically different from those found in a similar study conducted in Gondor, Ethiopia, in which fractures of the limb bones accounted for 66%. In this study, while most patients improved and were discharged without permanent complications (76%), 17 patients (12.3%) died following severe injuries and two sustained permanent disability. This is similar to the findings from another study in South Africa in which the death toll due to interpersonal violence was 8.3%, of all the deaths in the country.

The predisposing factors (the risk factors) in this study included the following: alcohol influence (32.6%); land conflicts (17.4%); robbery (14.3%); money (12.3%); domestic violence (5.8%); and others (2%). It is clear that these figures suggest that alcohol plus land conflicts combined add up to 50% of the risk factors in the population studied. These factors have some similarities with those found in other researches done on this subject in Ethiopia, Tanzania, and South Africa. These findings on the risk factors were comparable to those from similar studies conducted in Ethiopia, Dodoma (Tanzania) and India. However they were different from those from South Africa in which homicide, femicide and child sex abuse were found [6, 9, 10.]

In this review, the weapons used were related to the environments of the conflict. Most injuries occurred at home, where knives, swords, and sticks were often easily accessible and therefore used. This was followed by injuries on the road, where knives and sticks were again used. In the drinking places, bottles were often used. These findings indicate some variation from those in a similar study conducted at Groote schuur in South Africa in which 18.4 % of the injuries were caused by falls from heights, and 4.8% by fire-arms [13, 17]. The most common age group was 21-30 years (42%); followed by 31-40 years (34%) and 41-50 years (18%). Most victims of interpersonal violence were young, frustrated by unemployment, involved in robbery, and presenting with excess alcohol consumption when they got opportunity from relatives. The injuries related to interpersonal violence had enormous consequences to the family and the country by contributing to poverty, reducing the hours of productivity due to morbidity, and spending family resources for surgical interventions.

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Poverty was found to be a cause and consequence of interpersonal violence. It was a cause of frustrations, in turn, directly causing violence. The resulting morbidity (sometimes amputations) resulted in poverty and misery. Poverty has mostly been explored as a societal-level risk factor for interpersonal violence, although some studies have also examined its effects at the individual and relationship or household levels. The above findings are similar to those is similar studies elsewhere[1, 9 17].

Most of the injuries occurred during the night (77.5%), which suggests that the goal for assailants was to conceal their identity from the victims or witnesses. As for the cases from a bar, alcohol was often shared in the night. The fact that we collected 138 victims of interpersonal violence who voluntarily participated in this study within 4 months in 2 referral hospitals, without accounting for victims who did not need to transfer to referral hospitals for higher level of care, demonstrates that this is a significant problem in Rwanda.

Conclusion

1. The predisposing factors for interpersonal violence in Rwanda, as indicated by this study included land conflicts, alcohol abuse, robbery, unemployment, domestic violence, and low levels of education.
2. Interpersonal violence injuries contributed significantly to trauma related surgical morbidity and mortality.

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