DOI: 10.7860/JCDR/2014/8437.5096

Original Article

Community Medicine Section

Epidemiological Features of violence-related Injuries in Jamaica

TAZHMOYE V. CRAWFORD[1], DONOVAN A. MCGROWDER[2], JASPER D. BARNETT[3], JEWEL H. SHAW-SANDERSON[4]

ABSTRACT

Background: Violence-related injuries are common in Caribbean countries such as Jamaica and are a major cause of mortality and morbidity. The study examined the epidemiology of violence-related injuries and ascertained the extent to which the utilization of violence-related injury reports and surveillances inform health policy and programme planning implementation in Jamaica.

Materials and Methods: Primary data was gathered by the Ministry of Health through its Public Hospital Monthly Statistical Reporting System (HMSR) and the Jamaica Injury Surveillance System (JISS). These data files were collected over a four and five year period respectively. The sample size comprised 187,610 cases (117,615 from HMSR) and (69,995 from JISS) which were seen and treated at the public hospitals in Jamaica because of violence-related injuries. This study employed a descriptive analysis of visits and cases (episodes) relating to violence-relating injuries. Simple random sampling method was used in this study and the data was analysed using both Microsoft Excel and the Statistical Package for Social Scientists 18.0.

Results: The highest number of violence-related injuries was in 2007 and assault (stab wounds, gunshot and blunt injury) was the most frequent violence-related injury with human bites, and burns being the least. The highest number of violence-related injuries in males and females was in the age group 20-29 y. More males experienced violence-related injuries compared with females with male to female ratio of 1.35:1 to 1.45:1 in the years considered.

Conclusion: The findings of this study are consonant with local and international studies and confirm that assault was the most frequent violence-related injury. Males compared with their female counterparts are a stronger demographic risk factor where violence-related injuries are concerned. Violence-related injuries have spurred the charge for effective interventions, policy initiatives, and strategic and programme planning by the Ministry of Health, through multi-sectoral and multi-agency approaches in Jamaica.

Keywords: Assault, Epidemiology, Injuries, Jamaica, Male, Violence

INTRODUCTION

A global public health issue is injuries and violence which results in about 5.8 million deaths per year [1]. This figure accounts for one-tenths of the world's death and is approximately one-third more than the total number of deaths which occurs due to tuberculosis, malaria and HIV/AIDS combined [1]. Injuries due to road traffic crashes is responsible for about one-quarter of the 5.8 million deaths while nearly one-third is due to homicide and interpersonal violence such as suicide [2].

Death and serious life-threatening injuries occur as a result of violence, and beyond these are significant physical and mental consequences such as anxiety and depression [3]. The psychological harm experienced by victims of violent acts may put them at risk of becoming engaged in high-risk behaviours such as smoking, unsafe sexual practices, substance and alcohol misuse which in turn may lead to chronic disease such as diabetes mellitus and cardiovascular diseases, as well as cancers and HIV/AIDS leading to premature deaths [4].

Injuries due to violence are common in Caribbean countries including Jamaica and Trinidad and have been reported as a major cause of mortality and morbidity [5]. In Jamaica, injuries accounted for 8.6% of patients discharged from hospitals in 2002, and it was the second leading cause of hospitalization among patients in 1996 [6,7]. In Caribbean countries, most violence-related injuries are the leading cause of death among males in the age group 5-44 y and account for approximately three-fifths (58%) of deaths among males in the age group 15-24 y [8]. According to the Jamaica's Health and Lifestyle Survey Report in 2008, violence-related and non-intentional injuries contribute significantly to mortality and morbidity among youths and of those interviewed, 12.0% indicated that over the last five years they were seriously affected by injury. The study also reported that females (9.3%) were less susceptible than males (15.2%) [9]. Furthermore, males (5.0%) than females (3.4%) were more susceptible to violence-related injuries such as in interpersonal situations comprised of criminal matters, domestic affairs, fights, and self-abuse such as self-inflicting gunshots [9].

In Jamaica, intentional and unintentional injuries have been the leading cause of admission to the public hospitals. This places a tremendous burden on the resources of the health care services in terms of treatment cost, increase in the use of medical supplies/equipment, strain on the blood supply system, increase in bed occupancy, length of stay in hospital, as well as, increase in rehabilitation and convalescent services [10]. In response to this public health problem, the Ministry of Health uses a sentinel surveillance system involving 79 sites across the island, to monitor weekly data of intentional and unintentional injuries. Additionally a hospital based injury surveillance system, Jamaica Injury Surveillance system (JISS), was established in 2006 with nine of the largest hospitals across the island [6]. The JISS provides a profile of the patients injured by acts of violence and risk factors associated with injuries. It records the location, method and circumstances of the injury. Injuries are placed in different categories such as violence-related injuries, motor vehicle injuries, intentional self-harm (attempted suicide) and unintentional (accidental) injuries [6].

The study examined the epidemiology of violence-related injuries and ascertained the extent to which the utilization of violence-related injury reports and surveillances inform health policy and programme planning implementation in Jamaica.

MATERIALS AND METHODS

Data Collection

Primary data were gathered by the Ministry of Health through its Public Hospital Monthly Statistical Reporting System (HMSR) and the Jamaica Injury Surveillance System (JISS). These data files were

collected over a four and five year period respectively. In the HMSR, data was collected (upon registration of patients in Accident and Emergency Department) on a daily basis by all the public hospitals throughout the island of Jamaica. This is then collated and forwarded to the Ministry of Health's Head Office on a monthly basis, where it is checked and entered into the Health Records System for further analysis. There are 23 public government operated hospitals in Jamaica that provide health care for the population. The University Hospital of the West Indies (UHWI), a tertiary teaching and statutory hospital and these 23 public government operated hospitals provide approximately 90% of hospital-based care in the country.

The JISS is a subset of the Patient Administration System (an electronic database). The data is collected from nine major government hospitals (referred to as Sentinel Sites) based on the World Health Organization's Injury Surveillance Guidelines. The system monitors four categories of injuries: accident/unintentional, violence related, suicide attempts, and motor vehicle accidents. The unit of analysis was 187,610 episodes (117,615 from HMSR) and (69,995 from JISS) which were seen and treated at the public hospitals in Jamaica because of violence-related injuries. This study has done a descriptive analysis of visits and cases (episodes) relating to violence-related injuries.

STATISTICAL ANALYSIS

Simple random sampling method was used in this study, as this was found to be more feasible in guaranteeing the validity of this study. The data were analysed using both Microsoft Excel and the Statistical Package for Social Scientists 18.0 for Windows software programme, thus calculating frequencies and cross tabulations.

RESULTS

Violence-related injuries for the period 2007-2010 are given in [Table/Fig-1]. It was observed that the highest number of violence-related injuries were in 2007 and 2008 (31,932 and 31,546 respectively), and there was a 1.2% decrease within this period. There was a 2.6% decrease in violence-related injuries in 2009 compared with 2008, and a significant 23.8% decrease in 2010 compared with 2009. The least number of violence-related injuries was observed in 2010 (23, 414; [Table/Fig-1]).

[Table/Fig-1] also showed the number of assault, sexual assault/rape, attempted suicide, intentional burns and human bites. Assault (stab wounds, gunshot and blunt injury) was the most frequent violence-related injury followed by sexual assault, human bites, and burns being the least. The number of assault was highest in 2007 (29,633) and least in 2010 (21,534) with a significant 23.9% decrease in 2010 compared with 2009. Over the four year period, there were 0.6% (677/117,615) persons who reported violence-related injuries due to suicide attempts.

The number of violence-related injuries by age and gender is given in [Table/Fig-2]. The highest number of violence-related injuries in males and females was within the age group 20-29 y followed by 30-44 y and 10-19 y, with the least in the over 65 y age group.

More males experienced violence-related injuries compared with females in all the years under study. The ratio of males to females varies slightly with 1.45:1 (2007), 1.39:1 (2008), 1.41:1 (2009) and 1.35:1 (2010). The highest number of males (18,889) experienced violence-related injuries in 2007 and the least in 2010 (13,457). The highest number of females (13,206) experienced violence-related injuries in 2008 and the least in 2010 (9,957). There was a 25.2% decrease in violence-related injuries experienced by males in 2010 compared with 2009, whilst for females it was 21.8%.

Data collected from the nine major Sentinel Sites during the period 2004-2008 showed the main sources of injuries; namely blunt objects, pushing or bodily force, sharp objects, gunshot, sexual assault and others [Table/Fig-3]. The 4-year period reported no significant difference in overall cases of injuries. However, sharp (26,887) and blunt (22,283) objects followed by gun shots (5,396) were the most likely sources of injuries to be inflicted upon individuals, while the least were sexual assault (3,548) and others (1,161; [Table/Fig-3]).

DISCUSSION

Types of violence-related injuries identified

Over the years violence-related injuries and mortality threaten the quality of life of the Jamaican population. In this study the highest number of violence-related injuries was in 2007 and 2008 and while there was a minimal decrease from 2007 to 2009, the reduction from 2009 to 2010 was significant. Studies that examined violence-related or unintentional injuries among the Jamaican populace reported data over a period of years or single year. In one of these studies, the Jamaica Injury Surveillance System in its report for the period 1999-2000 identified 12,179 injury cases and approximately one-half (52%) were violence-related [11]. In a later study, the Jamaica's Health and Lifestyle Survey Report conducted in 2008, 1.1% and 1.8% of the respondents aged 15-74 suffered injuries from criminal and domestic incidents respectively 5-years prior to the study [9].

Both intentional and unintentional injuries are common in Jamaica [12,13]. Intentional injuries place an enormous burden on the financial and human resources of the health care facilities and the national economy [14]. In a report of the Jamaica Injury Surveillance System (involving 9 government operated hospitals) in 2004, the circumstances of violence-related injuries were mostly due to fights with acquaintances (76.0%) followed by mob or riot (10.8%) [15]. The method most commonly used to inflict the violence-related injuries was sharp objects (40.0%) followed by blunt objects (31.0%) and bodily forces (14.7%), and the least methods were choking, burn or strangulation (4.8%) and sexual assault (2.5%) [15]. The findings in this study suggest that the main intentional injury was assault which comprised of stab wounds, gunshot and blunt injury. Other intentional injuries include sexual assault, human bites, and burns with the latter being the least prevalent. Furthermore, data collected from the nine major Sentinel Sites during the period 2004-2008 showed the main sources of injuries being blunt objects, pushing or bodily force, sharp objects, gunshot and sexual assault. These results are consonant with a cross-sectional, descriptive study of 857 head-injured patients who were admitted to the University Hospital of the West Indies (UHWI) from 2000-2003, where 26.7% had intentional injuries which comprised mainly of assaults with blunt objects in 18.0% and to a lesser extent 2.7% were gunshot wounds to the head [16].

Violence-related injuries by age and gender

In English-speaking countries in the Caribbean, violence-related injuries are the main causes of death among males 5-14 y old while among the 15-24 age group, injury due to suicide and homicide is the most important cause of death [17]. Among adolescents and young adults interpersonal violence exists and in a population-based study of 3,401 respondents aged 15-30 y old in Trinidad, Barbados and Jamaica, three-quarters, mostly females reported experienced some form of violence act mostly enacted in a relationship [18]. Young persons that are perpetrators of violence-related injuries are likely to use alcohol and drugs, and possess guns. These youths are usually impulsive, display aggressive attitudes, and low educational achievement [19]. The injury demographics in terms of age group were as expected with the highest number of violence-related injuries in males and females observed within the age group 20-29 y, followed by 30-44 y and then 10-19 y, with least in the over 65 y-age group. In a similar recent report of the Jamaica Injury Surveillance System data in 2004, males under 29 y old were responsible for more than one-half of the violence-related injury visit (22% for males 20-29 y; 24% males under 19 y) [14].

The preponderance of male victims with violence-related injuries is consistent with reports from other studies [14,16]. The ratio of males to females in this study varies from 1.35:1 to 1.45:1 with most males recorded in 2007 and females in 2008. In the Jamaica's Health and Lifestyle Survey Report in 2008, the most common types of injury were stab wounds and cuts, followed by broken bones, and there were more incidences among males than females [9]. In an earlier prospective study of 88 patients (76.1% males) with head injuries admitted at the University Hospital of the West Indies over a one-year period, under one-half (47.0%) had intentional injuries due to physical fighting and stone throwing, gunshot wounds and penetrating injuries from physical fighting [16]. Interpersonal violence is common among males and to a lesser extent females and in a report by the Jamaica Constabulary Force in 2006, there were 1,160 persons with a male to female ratio of 4.3:1 who experienced serious injuries as a result of interpersonal violence. For slight injuries due to the use of a blunt object or shoving/pushing there were 5,968 persons with a male to female ratio of 1.2:1 [14].

Sexual assault and suicide among females and males

Most acts of sexual violence are experienced predominantly by women and girls, and perpetrated by men and boys [20]. Previous research shows that sexually violent behaviour in men has been associated with the perpetrators being exposed to family violence, presence of uncaring and emotionally and distant fathers [21,22]. In the population study of youths and adolescents in Jamaica, Trinidad and Barbados, more women than men (72.6% vs 57.2%) reported that they experienced sexual coercion. Further analysis showed that women in Jamaica were two times more likely than men [18]. Our findings showed that in the period 2004-2008, 5.1% experienced sexual assault. The negative impact on victims of sexual assault include reproductive problems, mental health consequences which sometimes are long lasting, and mortality issues such as HIV infection, suicide and murder [23,24].

Suicide rates varied from country to country and worldwide on average the ratio of males suicide to females is 3:1 [25]. According to Jamaica Constabulary Force Statistics in 2004, the ratio of male suicides to females was 3.7:1 [15]. In this study over the four year period from 2007-2010, there were 0.6% (677/117,615) persons who reported violence-related injuries due to suicide attempt. Persons at risk of harming themselves or committing suicides may be exposed to a number of stressful circumstances or events such as loss of an immediate family member or close friend, unemployment, disagreement or arguments with friends or family, work or legal-challenges which may become unbearable, breakdown in important relationship and living in poverty [20,26]. Other predisposing risk factors include a history of sexual or family abuse in childhood, engaging in substance or alcohol misuse and physical illnesses that are painful or disabling and experiencing social isolation [27,28]. In addition, there is a general feeling of hopelessness and having psychiatric problems such as schizophrenia, depression and other mood disorders can play a significant role in a person committing suicide [29,30].

One of the main policy priorities of the Ministry of Health of Jamaica is to decrease the possible outcomes of non-preventable [31] illnesses such as injury, disability and premature deaths and to reduce the severity of the impact of those which are preventable. In order to accomplish this goal, the Ministry of Health is involved in multi-sectorial collaboration with other Ministries and stakeholders in implementing programmes relating to violence prevention, nutrition, physical activities, reduction of chronic diseases, environmental and mental health [31].

In an effort to curb episodes of violence-related injuries, the Ministry of Health of Jamaica has been recording and monitoring injuries since 1996. The efforts have allowed for this Sector to better understand the types of injuries affecting individuals and their prevalence. This data (particularly violence-related injuries) have been used to guide policies of the Safe Schools' Programme. The data also guides the Code of Conduct Policy on violence prevention, thus addressing key issues such as the Rights of a Child - a collaborative effort among the United Nations Children's Fund (UNICEF), Early Childhood Commission, Office of the Children's Advocate and the Ministry of Health.

In terms of limitations, the data sets related to the Hospital Monthly Statistical Report (HMSR) and Jamaica Injury Surveillance System (JISS) reported violence-related injuries by visits and case-base respectively. A fully-reported case-base data would be able to ascertain the true unit of analysis. Therefore, the JISS should be

Types	2007	2008	2009	2010	Total
Assault	29633	29250	28297	21534	108714
Sexual Assault	1556	1483	1596	1225	5860
Attempted Suicide	135	182	219	141	677
Burns	35	60	22	23	140
Bites	573	571	589	491	2224
Total	31932	31546	30723	23414	117615

[Table/Fig-1]: Types of violence-related injuries
Source: Ministry of Health, Jamaica 2010 [32]

Age Range	2007		2008		2009		2010		Total
	Male	Female	Male	Female	Male	Female	Male	Female	
<5	404	357	363	334	244	241	229	195	2367
5-9	872	586	814	585	609	420	597	356	4839
10-19	4515	3875	4194	3649	4219	3552	2995	2895	29894
20-29	4860	3735	4581	3826	4636	3815	3326	2920	31699
30-44	5105	3129	5013	3205	4955	3266	3682	2395	30750
45-64	2436	1046	2707	1302	2709	1184	2160	976	14520
65+	620	267	580	273	570	232	434	193	3169
Not Known	77	48	88	32	53	18	34	27	377
Total	18889	13043	18340	13206	17995	12728	13457	9957	117615

[Table/Fig-2]: Violence-related injuries by age and gender, *Source: Ministry of Health, Jamaica 2010 [32]*

Year	Blunt Objects	Push/ Bodily Force	Sharp Objects	Gun Shot	Sexual Assaults	Other	Total
2004	4616	2216	5876	1053	744	264	14769
2005	4423	2048	5637	1365	749	222	14444
2006	4482	2139	5263	1026	726	222	13858
2007	4336	2020	4818	1076	735	219	13204
2008	4426	2295	5293	876	594	236	13720
Total	22283	10720	26887	5396	3548	1161	69995

[Table/Fig-3]: Sources of injuries surveyed at specialized Government hospitals,
Source: Jamaica Injury Surveillance Survey, 2008 [33]

expanded to all hospitals, and consistent reporting by the HMSR and the JISS would enable statistical accuracy for a more solid policy-making and programme planning.

CONCLUSION

In conclusion, violence-related injuries are of serious economic, public health and policy concern to Jamaica. The findings of this paper are consonant with local and international studies which confirm that assault was the most frequent violence-related injury and that males (more than their female counterparts) were a stronger demographic risk factor where violence-related injuries are concerned. As a result, information pertaining to such dilemma has spurred effective interventions, strategic and programme planning, as well as policy initiatives by the Ministry of Health, through multi-sectorial and multi-agency approaches.

ACKNOWLEDGEMENTS

Thanks to the former Chief Medical Officer for granting permission to publish the data in this paper. Special thanks to the Directors in Health Promotion and Protection Division and the Statisticians and the former Director of Policy, Planning and Development Division in the Ministry of Health, for information and support; also PAHO, LIHP.

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PARTICULARS OF CONTRIBUTORS:
1. Policy, Planning and Development Division, Ministry of Health, 2-4 King Street, Kingston, Jamaica.
2. Department of Pathology, Faculty of Medical Sciences, Mona Campus, Kingston, Jamaica.
3. Policy, Planning and Development Division, Ministry of Health, 2-4 King Street, Kingston, Jamaica.
4. Policy, Planning and Development Division, Ministry of Health, 2-4 King Street, Kingston, Jamaica.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Tazhmoye V. Crawford,
Ministry of Health, 2-4 King Street, Kingston, Jamaica.
Phone : 1-876-362-3628, E-mail : crawfordtazhmoye@yahoo.co.uk

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Jan 10, 2014**
Date of Peer Review: **Jun 17, 2014**
Date of Acceptance: **Jun 30, 2014**
Date of Publishing: **Nov 20, 2014**