



Characterization of Morbidity from Interpersonal Violence in Brazilian Children and Adolescents

*Thaliny Batista Sarmiento de OLIVEIRA, Magaly Suênia Abrantes PINTO, Rodrigo Feliciano de MACEDO, Thaisy Sarmiento Batista de OLIVEIRA, *Alessandro Leite CAVALCANTI*

Center for Biological and Health Sciences, State University of Paraíba, Campina Grande, Brazil

***Corresponding Author:** Email: dralessandro@ibest.com.br

(Received 11 May 2014; accepted 15 July 2014)

Abstract

Background: Children and adolescents are vulnerable to violent situations in their social, family and school environment. The aim of the study was to characterize morbidity due to violence in Brazilian children and adolescents.

Methods: A cross-sectional study through the analysis of 1,356 corpus delicti medical reports and police reports of children and adolescents aged 0-19 years, victims of interpersonal violence was conducted from January 2008 to December 2011. Sociodemographic variables related to victims, offenders and aggressions were analyzed.

Results: There was a prevalence of females over males (56.9% vs. 43.1%) with age between 15 and 19 years (64.7%). There was a significant association between variables age of the victim and place of occurrence, sex and type of aggression, sex and number of lesions, presence of fracture, maxillofacial injury, oral cavity lesion and physical violence; physical violence and involvement of face, neck, abdomen and back ($P < 0.001$). Public streets (56.4%) were the main place of occurrence of events, followed by home (33.1%). Family members accounted for 26.48% of aggressions. The face was the most affected body region (43.36%), with 12.61% of records referring to oral cavity lesions.

Conclusion: Violence was responsible for a large number of non-fatal injuries to children and adolescents, affecting mainly females aged 15 and 19 years. The occurrence of such events is more frequent on public streets and at home. Most victims had multiple injuries and the face was the most affected body region.

Keywords: Adolescent, Child, Morbidity violence, Brazil

Introduction

The World Health Organization (WHO) defines violence as the intentional use of physical force or power, real or threatened, against oneself, another person, or a group or community that results (or resulted, or is likely to result) in injury, death, psychological harm, maldevelopment or deprivation (1). Violence is understood as a social and historical phenomenon that follows the entire experience of man (2). The occurrence of these events may be associated with factors such as age, low educational level, alcohol consumption and accultura-

tion practices, often emphasized by alcohol consumption and acceptance of violence (3).

Worldwide, these injuries during childhood and adolescence have an important impact on the individual and population (4). In Europe, every year, over 40,000 children die from injuries, and for all of them, there are thousands of victims who live with varying degrees of disabilities or physical and psychological sequelae (4). Fatal injuries represent a small fraction of the problem. Non-fatal vio-

lence compromises the health of million people worldwide (5).

In Brazil, violence has been one of the most prominent causes of morbidity and mortality (6). From January 2008 to October 2012, there were 39,798 cases of aggression to children and adolescents, 24,734 of them in the age group 15-19 years. The most affected were males, corresponding to 79.21% of cases (7).

Records of cases of violence among children and adolescents have increased every year (8). Many of the victims are marked by the effects of violence in their homes, schools or communities (9). For challenging the authority of parents, adolescents can provoke violent responses. In comparison, infants and young children are more likely to be victims due to their disability and physical frailty, helplessness and defiant behavior (8).

The Brazilian Criminal Procedure Code establishes that when the offense leaves trace, the corpus delicti examination becomes mandatory. The corpus delicti examination is the verification of the existence of crime, done by experts directly, or through other evidence, when traces, although material, disappear. The issue of an expert report attests the materiality of the offense, exhibits a reasoned conclusion with all relevant observations to what was verified, discussing on life-threats and severity and extent of injury in the context of body injuries (10).

The maxillofacial region occupies the most prominent position in the human body, making it vulnerable to the occurrence of lesions (11). In many cases of violence in children and adolescents, face, head and mouth are involved (12-14).

The consequences produced by violence have a broad dimension (5), because in addition to affecting individual and collective health, it also has consequences to other sectors, such as increased cost of emergency services, assistance and rehabilitation, with more onerous expenses than those of conventional medical procedures (15). Approximately 3.3% of the Gross Domestic Product (GDP) are used with the direct costs of violence. This percentage rises when indirect expenditures and transfers of resources are included (16).

Therefore, violence cannot be understood solely as a public health issue, but also as a public health problem, because it affects the individual and the collectivity, which requires prevention and confrontation based on specific policies and organization of practices and specific services (2).

Considering the impact that violence generates to the lives of children and adolescents, this study aimed to characterize morbidity due to violence in this population occurred between 2008 and 2011 in Campina Grande, Paraiba, Brazil.

Material and Methods

Study Design

A cross-sectional study was conducted through the analysis of medical reports of corpus delicti examinations and respective police reports (PR) of children and adolescents non-fatal victims from external causes reported at the Center for Forensic Medicine and Dentistry of Campina Grande, Paraiba, Brazil.

Sample

The study sample consisted of 1,356 reports of body injury referring to children and adolescents aged 0-19 years, who were confirmedly victims of interpersonal violence from January 2008 to December 2011. The following exclusion criteria were adopted: reports with no information on the age of the affected individual or those aged out of the range from 0 to 19 years as well as reports showing undetermined cause or not belonging to the group of External Causes defined by CID-10.

Data Collection

Information regarding sex, age, place of occurrence, perpetrator, number of lesions, affected body region, presence of fracture, maxillofacial injury, maxillofacial fractures and oral cavity lesions were collected by a single examiner and recorded in a specific form.

Data Analysis

Data analysis involved descriptive statistics (frequency distribution) and analytic statistics. To test the association between the occurrence of rape

and other variables a process of bivariate analysis was conducted, using the exact versions of the nonparametric Pearson's chi-squared test or Fisher's exact test. *P* value less than 0.05 was considered statistically significant.

Ethical Aspects

This study was conducted in compliance with the ethical guidelines issued by the Brazilian Ministry of Health/National Health Council Resolution 466/12 on research involving human subjects. The research project was approved by the Ethics Committee of the State University of Paraiba, Brazil.

Results

The distribution of victims by sex reveals predominance of females over males (56.9% versus

43.1%). The age ranged from 0 to 19 years, with mean of 14.5 years (\pm 4.2 years) and median of 16 years. Significant association ($P < 0.001$) was verified between sex and age of the victim. For the youngest age group (0-4 years), boys were the main victims (65.0%), while among adolescents aged 15-19 years, there was a predominance of female victims (60.1%) (Table 1).

Table 2 shows a significant association between place of occurrence and age ($P < 0.001$). The highest number of cases was observed in the population aged 15-19 years and on public streets (74.4%). Home was the most common place of occurrence in the population aged 0-4 years and 5-9 years. In 6.8% of reports, there were records of violence in the school environment, and in 1.5%, no information on the place of occurrence was found.

Table 1: Distribution of victims by age group and sex

Age Group	Male		Female		Total		<i>P</i> -value
	n	%	n	%	n	%	
0-4 years	41	65.0	22	35.0	63	4.7	<0.001
5-9 years	57	54.3	48	45.7	105	7.7	
10-14 years	137	44.0	174	56.0	311	22.9	
15-19 years	350	39.9	527	60.1	877	64.7	
Total	585	43.1	771	56.9	1356	100.0	

Table 2: Distribution of victims according to place of occurrence and age of the victim

Place of Occurrence	0-4 years		5-9 years		10-14 years		15-19 years		Total		<i>P</i> -value
	n	%	n	%	n	%	n	%	n	%	
Public streets	15	2.0	25	3.2	156	20.4	570	74.4	766	56.5	<0.001
Home	45	10.0	73	16.3	109	24.3	222	49.4	449	33.1	
School	3	3.3	5	5.4	36	39.1	48	52.2	92	6.8	
Recreation area	0	0.0	0	0.0	3	15.0	17	85.0	20	1.5	
Work	0	0.0	0	0.0	2	33.3	4	66.7	6	0.4	
Collective housing	0	0.0	0	0.0	1	50.0	1	50.0	2	0.1	
Not informed	0	0.0	2	9.5	4	19.1	15	71.4	21	1.5	
Total	63	4.7	105	7.7	311	22.9	877	64.7	1356	100.0	

Relatives accounted for 26.5% of aggressions. However, the main aggressors are frequently other known people, but without belonging to the family circle, or those unknown to victims, not includ-

ing neighbors, who were mentioned in 80 records as aggressors. In 6.7% of reports, there was no data on the injury author (Table 3). Significant association ($P < 0.001$) was found between type of

aggression and sex of the victim, with a prevalence of physical violence in both sexes (80.6%). Morbidity due to firearm shows lower frequency

(3.5%) compared to other types of violence and only 8 cases (0.6%) involving women were reported (Table 4).

Table 3: Distribution of victims according to injury author and sex

Injury Author	Male		Female		Total		P-value
	n	%	n	%	n	%	
Relatives	127	35.4	232	64.6	359	26.5	<0.001
Others	371	44.9	455	55.1	826	60.9	
Neighbor	27	33.8	53	66.2	80	5.9	
Unknown	60	65.9	31	34.1	91	6.7	
Total	585	43.1	771	56.9	1356	100.0	

Table 4: Distributions of victims according to type of aggression and sex

Type of Aggression	Male		Female		Total		P-value	PR (CI 95%)
	n	%	n	%	n	%		
Physical violence								
Yes	419	30.9	674	49.7	1093	80.6	<i>P</i> <0.001	1.00
No	166	12.2	97	7.2	263	19.4		0.36 (0.27-0.48)
Firearm								
Yes	39	2.9	8	0.6	47	3.5	<i>P</i> <0.001	6.81 (3.15-14.69)
No	546	40.2	763	56.3	1309	96.5		1.00
Bladed weapon								
Yes	127	9.4	88	6.5	215	15.9	<i>P</i> <0.001	2.15 (1.60-2.89)
No	458	33.8	683	50.3	1141	84.1		1.00

Significant association was observed between sex and number of lesions (*P* < 0.001 [RP = 0.99, 0.80 to 1.23]). The number of lesions identified in victims ranged from 1 to 5, with mean of 1.65 (± 0.73) and median of 2.0 (Table 5). Table 6 distrib-

utes morbidity according to affected body region and the occurrence of physical violence, showing significant association (*P* < 0.001) with this type of aggression and involvement of face, neck, abdomen and back..

Table 5: Distribution of victims according to sex and number of lesions

Sex	Number of Lesions				Total		P-value
	Single		Multiple		n	%	
	n	%	n	%			
Male	286	48.9	299	51.1	585	100.0	0.001
Female	378	49.0	393	51.0	771	100.0	
Total	664	49.0	692	51.0	1356	100.0	

The other body regions did not show significant associations. Victims who had face injuries, 38.2% were physically aggressed and only 5.1% were affected by other types of aggression. The most injured body regions were face (43.3%), upper limbs (46.0%) and lower limbs (22.6%). In only 1.0% of

reports, genitals were indicated as the affected body region.

Regarding fractures and maxillofacial injuries, Table 7 shows a significant association (*P* < 0.001) between presence of fracture, maxillofacial injury, oral cavity lesions and physical violence. The association between maxillofacial fracture and physi-

cal violence was not significant ($P = 0.474$). It was also observed that most of physically aggressed victims did not have fractures (77.4%). Maxillofa-

cial fractures were present in only 0.8% of victims and in 11.6% of cases of physical violence, injuries affected the oral cavity.

Table 6: Distribution of victims according to affected body region and physical violence

Affected Body Region	Physical violence				Total		P-value	PR (CI 95%)
	Yes		No					
	n	%	n	%	n	%		
Head								1.00
Yes	160	11.8	46	3.4	206	15.2	0.247	0.80 (0.56-1.15)
No	933	68.8	217	16.0	1150	84.8		
Face								
Yes	518	38.2	70	5.1	588	43.3	<0.001	2.48 (1.84-3.34)
No	575	42.4	193	14.2	768	56.6		1.00
Neck								
Yes	165	12.2	27	2.0	192	14.2	<0.05	1.55 (1.01-2.39)
No	928	68.4	236	17.4	1164	85.8		1.00
Thorax								
Yes	142	10.5	40	3.0	182	13.5	0.344	1.00
No	951	70.1	223	16.4	1174	86.5		0.83 (0.56-1.21)
Abdomen								
Yes	41	3.0	32	2.3	73	5.3	<0.001	1.00
No	1052	77.6	231	17.0	1283	94.6		0.28 (0.17-0.45)
Back								
Yes	227	16.7	73	5.4	300	22.1	<0.05	1.00
No	866	63.9	190	14.0	1056	77.9		0.68 (0.50-0.92)
Upper limbs								
Yes	504	37.2	120	8.8	624	46.0	0.888	1.02 (0.77-1.33)
No	589	43.4	143	10.6	732	54.0		1.00
Lower limbs								
Yes	248	18.3	58	4.3	306	22.6	0.825	1.03 (0.75-1.43)
No	845	62.3	205	15.1	1050	77.4		1.00
Genitals								
Yes	13	1.0	1	0.07	14	1.0	0.244	3.15 (0.41-24.21)
No	1080	79.7	262	19.3	1342	99.0		1.00

Table 7: Distribution of victims according to the presence of fracture, maxillofacial injury, maxillofacial fractures, oral cavity lesions and physical violence

Variable	Physical violence				Total		P-value	PR (CI 95%)
	Yes		No					
	n	%	n	%	n	%		
Presence of fracture								
Yes	43	3.2	50	3.7	93	6.9	$P < 0.001$	1.00
No	1050	77.4	213	15.7	1263	93.1		0.17 (0.11-0.26)
Maxillofacial injury								
Yes	515	38.0	69	5.1	584	43.1	$P < 0.001$	2.50 (1.85-3.37)
No	578	42.6	194	14.3	772	56.9		1.00
Maxillofacial fractures								
Yes	11	0.8	4	0.3	15	1.1	$P = 0.474$	1.00
No	1082	79.8	259	19.1	1341	98.9		0.65 (0.20-2.08)
Oral cavity lesions								
Yes	157	11.6	14	1.0	171	12.6	$P < 0.001$	2.98 (1.69-5.24)
No	936	69.0	249	18.4	1185	87.4		1.00

Discussion

Based on the present study, females were the main victims of violence and the aggressors are frequently known people. Violence must be viewed as a phenomenon linked to a social and structural problem to which society is exposed (17). Children and adolescents are vulnerable to violent situations in their social, family and school environment (13). The age group 15-19 years was the most affected by aggressions, corroborating the findings of other authors (18). Some variables that characterize violence were not identified in some reports such as perpetrator and time and place of occurrence, contributing to weaknesses in the assessment of this phenomenon.

Women were the main victims, with a female: male ratio of approximately 1, 32:1, which is in agreement with literature (19, 20). These data may be related to that fact that males are more affected by fatal injuries (6, 21, 22), being more frequently related to violence in records that refer to mortality. Moreover, some researchers attribute increased vulnerability of females to aggressions to the ideology of supposed female weaknesses (17) as to the condition of subordination of women in society, assigned since childhood (20).

In the context in which violence occurs, the relationship between victim and perpetrator, its dynamics and factors make the event a matter of great complexity (23).

Public streets are where the largest number of cases of violence among adolescents occurs. In these environments, people are exposed to factors that contribute to the existence of cases of violence such as use of drugs and alcohol and are more exposed to assaults and weapon robbery (24). Children are more likely to suffer aggressions at home. Home has been considered a common site for the occurrence of cases of violence, revealing that the perpetrators are often people from within the family or have easy access to it (19).

The number of aggressions in the school environment increased in the four years of study compared to previous years, as was observed in a previous study (13), which assessed violence in

schools of Campina Grande, Brazil, between 2003 and 2006 and identified only 42 cases, representing less than half of what was seen in this study. In the last 30 years, violence in school has shown significant growth (25).

Aggressions characterized by injuries from firearms or bladed weapon mostly led to death (9), in which few cases of non-fatal injuries in the study population were observed. This study revealed that, with respect to firearms, men are 6.81 more likely to be affected by these injuries than women. Physical aggressions accounted for nearly all cases of morbidity due to violence, with more than half having multiple lesions, corroborating other studies (11). Women were also the primary victims in this type of aggression.

In victims affected by physical violence, the body regions most commonly affected were face, upper and lower limbs. This research also revealed that victims of physical violence are 2.5 times more likely to have maxillofacial injuries and 2.9 more likely to have oral cavity lesions. Some studies indicate physical aggressions as one of the most frequent causes of maxillofacial injuries in children and adolescents (26, 27). This fact may be associated with the fact that face is a region of easy viewing and access due to its anatomic location. Violence prevention programs can help reduce maxillofacial trauma resulting from intentional injuries among the population (28).

Social and health consequences caused by violence are beyond death and injuries; they include severe damage to physical and mental health and development of victims, associated risk factors and risk behaviors. Therefore, aggression contributes to a broad spectrum of adverse effects both for the victim and for society throughout life (23).

Conclusion

Violence accounts for the large number of non-fatal injuries to children and adolescents, affecting mainly females aged 15-19 years. The occurrence of such events is more frequent on public streets and at home. Most victims had multiple injuries and the face was the most affected body region.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Acknowledgements

This study is a part of M. Sc. thesis in Public Health. The authors thank the Vic-chancellor of Research and Technology of State University of Paraíba, Brazil, for approving the project and providing financial support. The authors declare that there is no conflict of interests.

References

1. World Health Organization (2002). *World report on violence and health: summary*. 1st ed, WHO, Geneva, pp. 14-23.
2. Minayo MCS (2006). The inclusion of violence in the health agenda: historical trajectory. *Ciênc. Saúde Coletiva*, 11 (2): 375-85.
3. Cadena SJ (2012). Intimate partner violence and alcohol use among the Ngöbe and Buglé indigenous population of Panama, Central America. *Rev Colomb Enferm*, 7 (7): 54-67.
4. Polinder S, Haagsma JA, Toet H, Brugmans MJP, Beeck EFV (2010). Burden of injury in childhood and adolescence in 8 European countries. *BMC Public Health*, 10: 45-52.
5. Mercy JA, Krug EG, Dahlberg LL, Zwi AB (2003). Violence and health: The United States in a global perspective. *Am J Public Health*, 92 (12): 256-61.
6. Reichenheim ME, Souza ER, Moraes CL, Jorge MHPM, Silva CMFP, Minayo MCS (2011). Violence and injuries in Brazil: the effect, progress made, and challenges ahead. *Lancet*, 377 (9781): 1962-75.
7. Brasil. Ministério da Saúde. Sistema de Vigilância em Saúde. Departamento de Atenção ao Sistema de Informação em Saúde. Sistema de Informação Hospitalares no SUS. Morbidade hospitalar do SUS por causas externas. Available: <http://tabnet.datasus.gov.br/cgi/defptohtm.exe?sih/cnv/fruf.def>.
8. Cavalcanti AL (2010). Prevalence and characteristics of injuries to the head and orofacial region in physically abused children and adolescents – a retrospective study in a city of the Northeast of Brazil. *Dent Traumatol*, 26 (2): 149-53.
9. Reich K, Culross PL, Behrman RE (2002). Children, youth, and gun violence: Analysis and recommendations. *Future Child*, 12 (2): 4-23.
10. Nucci GS (2003). Código penal comentado. 4th ed. Sao Paulo: *Revista dos Tribunais*; 2003.
11. Chalya PL, Mchembe M, Mabula JB, Kanumba ES, Gilyoma JM (2011). Etiological spectrum, injury characteristics and treatment outcome of maxillofacial injuries in a Tanzanian teaching hospital. *J Trauma Manag Outcomes*, 5 (1): 7-12.
12. Carvalho TBO, Cancian LRL, Marques CG, Piatto VB, Maniglia JV, Molina FD (2010). Six years of facial trauma care: an epidemiological analysis of 355 Cases. *Braz J Otorhinolaryngol*, 76 (5): 565-74.
13. Cavalcanti AL (2009). Maxillo facial injuries in victims of violence at school environment. *Ciênc. Saúde Coletiva*, 14 (5): 1835-42.
14. Maliska MCS, Lima Júnior SM, Gil JN (2009). Analysis of 185 maxillofacial fractures in the state of Santa Catarina, Brazil. *Braz Oral Res* 23 (3): 268-74.
15. Brasil (2005). Ministério da Saúde. National Health Policy for Reducing Accidents and Violence. 2nd ed. Brasília: Ministério da Saúde.
16. Briceño-León R (2002). Violencia, sociedad y justicia en América Latina. CLACSO. Available from: <http://bibliotecavirtual.clacso.org.ar/ar/libros/violencia/violencia.html>.
17. Garbin CAS, Rovida TAS, Joaquim RC, Paula AM, Guimarães e Queiroz APD (2011). Reported violence: occurrences of maltreatment against children and adolescents registered in a police unit. *Rev Bras Enferm*, 64 (4): 665-70.
18. Espitia-Hardeman V, Borse NN, Dellinger AM, Betancourt CE, Villareal AN, Caicedo LD, Portillo C (2011). The burden of childhood injuries and evidence based strategies developed using the injury surveillance system in Pasto, Colombia. *Inj Prev*, 17 (1): 38-44.
19. Guimarães JATL, Villela WV (2011). Characteristics of physical and sexual violence against children and adolescents examined at the Forensic

- Medicine Institute in Maceió, Alagoas State, Brazil. *Cad Saude Pública*, 27 (8): 1647-53.
20. Gawryszewski VP, Valencich DMO, Carnevalle CV, Marcopito LF. Child and adolescent abuse in the state of São Paulo, Brazil, 2009. *Rev Assoc Med Bras*, 58 (6): 659-65.
 21. Center for Disease Control and Prevention (2012). Vital signs: Unintentional injury deaths among persons aged 0-19 years, United States, 2000-2009. US Department of Health and Human Services, CDC. Available from: <http://www.cdc.gov>.
 22. Hu Y, Wu L, Yu X, Zhang D, Liu X, Wang Y (2011). Analysis of injury death trends among women in Macheng City, China, 1984-2008. *BMC Public Health*, 11 (13): 698-703.
 23. World Health Organization (2006). Preventing child maltreatment: a guide to taking action and generating evidence. World Health Organization and International Society for Prevention of Child Abuse and Neglect, Geneva.
 24. Muñoz-Echeverri IF, Noreña-Herrera C, Londoño BE, Rojas-Arbeláez CA (2011). Morbilidad atendida y conductas de riesgo de latencia y adolescencia en situación de calle de Medellín, 2008. *Rev Salud Pública*, 13 (2): 207-18.
 25. Linakis JG, Amanullah S, Mello MJ (2006). Emergency department visits for injury in school-aged children in the United States: a comparison of nonfatal injuries occurring within and outside of the school environment. *Acad Emerg Med*, 13 (5): 567-70.
 26. Hernández RA, Hernández R, Hernández A, Gil ZN (2012). Maxillofacial trauma: Prevalence in the San Vicente de Paul Regional University Hospital, San Francisco de Macorís, Dominican Republic. *Int J Third World Med*, 10 (1): 1-8.
 27. Kim SH, Lee SH, Cho PD (2012). Analysis of 809 facial bone fractures in a pediatric and adolescent population. *Arch Plast Surg*, 39 (6): 606-11.
 28. Cavalcanti AL, Bezerra PKM, Oliveira DM, Granville-Garcia AF (2010). Maxillofacial injuries and dental trauma in patients aged 19-80 years, Recife, Brazil. *Rev Esp Cir Oral Maxilofac*, 32 (1): 9-14.