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Mestre Sofia Lalanda Frazão

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Faculdade de Medicina da Universidade do Porto, 31/7/2013

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*Para a minha família*

Comparative study of head and neck injuries in domestic violence victims

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### Abstract

**Background:** Domestic violence is a current issue with severe consequences in health and socio-economical levels, not only for the victims but also their families and, even, abusers. Domestic violence victims often present injuries to the head and neck. Several studies have succeeded in demonstrating that injuries in these areas can be significant markers of abuse, however there are few or no studies that compare these injuries in different groups of victims, as children, intimate partners and elders. **Objective:** This study aims to compare the mechanisms of physical abuse and its resulting consequences in the head and neck, according to the victim's group, therefore contributing to a better understanding of the phenomenon.

**Methods:** Forensic reports of alleged victims of physical abuse in the domestic setting, with

head and neck injuries, evaluated at the north services of the National Institute of Legal

Medicine of Portugal, were retrospectively reviewed for comparison studies. **Results:**

Punching was the most frequent mechanism of abuse (44%), despite some statistical differences found according to the victims' group. Some differences were found in respect to the location (75% face, 42% skull and 9% neck) but very few regarded the type of injuries (55% bruises). Permanent physical consequences (9%) showed differences between the groups. **Conclusions:** The circumstance of similar results between the groups, except for the mechanisms of the physical aggression, doesn't allow us to identify any characteristics of the injuries to serve as markers to corroborate the diagnosis of domestic violence cases, however we must still be alert for the fact that, as stated in literature, victims of domestic violence are more prone to be wounded in the head (especially face) and neck, and, therefore, injuries in these locations should call our attention, for we may be facing a case of abuse. Further studies on this matter are needed.

**Keywords:** Domestic violence, child abuse, intimate partner violence, elder abuse, head and neck injuries

### Comparative study of head and neck injuries in domestic violence victims

Domestic violence (DV) is a wide concept that includes not only intimate partner violence (IPV) but also violence against children and elders (Krug, Mercy, Dahlberg, & Zwi, 2002). It is practiced within the family relationship in a broad sense, regardless of gender and age of the victim or the aggressor, or their cohabitation (Magalhães, 2010). It frequently remains hidden and undiagnosed since patients often conceal that they are in abusive relationships or they have no capacity to understand the behavior they are submitted as an abuse. Furthermore, clues pointing to abuse may be subtle or absent.

Domestic violence is a serious and common problem that includes a broad pattern of coercive or violent tactics used by one person to establish, maintain power and control over the other. These tactics may include physical, psychological, sexual and economic abuse, among others (Magalhães, 2010; Thompson, Bonomi, Anderson, Reid, Carrell, Dimer, & Rivara, 2006).

However, despite being a chronic life threatening condition it is treatable but, if abuse is left untreated, its severity and frequency can worsen, leading to serious adverse effects to physical and mental health as well as to family and social dynamics with significant costs for communities (Berrios & Grady, 1991; Campbell, 2002; Coker, Davis, Arias, Desai, Sanderson, Brandt, & Smith, 2002; Helweg-Larsen & Kruse, 2003; McCaw, Golding, Farley, & Minkoff, 2007; Thompson et al., 2006; Ulrich, Cain, Sugg, Rivara, Rubanowice, & Thompson, 2003).

The recognition of acute injury patterns are important in aiding DV detection and diagnosis, before the escalating violence leads to more severe injuries or death.

Head and neck areas have been reported as the most frequently affected areas in physical abuse in the case of DV victims. They can account for a range from 40% to 81% of all injuries (Berrios & Grady, 1991; Bhandari, Dosanjh, Tornetta, & Matthews 2006; Brink,

Vesterby, & Jensen, 1998; da Fonseca, Feigal, & ten Bensel, 1992; Le, Dierks, Ueeck, Homer, & Potter, 2001; Perciaccante, Ochs, & Dodson, 1999; Saddki, Suhaimi, & Daud, 2010). For instance, women who reported to emergency departments with head and neck injuries were seven and a half times more likely to be victims of DV than women whose injuries were limited to other areas of the body (Perciaccante et al., 1999). Evidence suggests that unwitnessed head or neck injuries should be highly suspect for being related to abuse, while thoracic, abdominal and pelvic injuries were no more associated to abuse than other injuries etiologies (Wu, Huff, & Bhandari, 2010). Thus, an injury to the head and neck regions of women may be an initial marker of DV (Saddki et al., 2010). The same seems to happen with the other victims of DV.

Considering there are different types of abuse according to the group of victims involved (namely children, intimate partners and elders), it is possible that its mechanisms, specific locations and types of injuries are also different. Given the visibility and prevalence of head and neck injuries in DV victims, the aim of this study is to analyze the mechanisms of abuse and the resulting head and neck injuries for these three groups, in order to help service providers better understand where to look for DV related injuries and to help the providers better differentiate injuries that may have occurred accidentally versus injuries inflicted intentionally and, therefore, contribute for an appropriate and timesaving detection of DV cases.

## Method

A retrospective research was conducted through a database of clinical forensic medical reports related to alleged cases of DV evaluated in the north services of the National Institute of Legal Medicine of Portugal (INML). Cases were randomly selected, according to the following inclusion criteria: (a) pressing charge for physical abuse; (b) allegedly

perpetrated by a parent, a current or former intimate partner (including marital relationships, common-law relationships, dating and extramarital relationships) or by another family member with child or elder-care responsibilities; (c) victim presenting head or neck injuries (independently of presenting injuries in other locations). Three groups of 75 individuals each were considered: (a) children (under 18 years-old); (b) intimate partners (older than 15 years old, excluding cases of child abuse between 16 and 17 years of age); (c) elderly (older than 64 years old, excluding the cases of intimate partner violence).

Head injuries included skull and face injuries (soft tissues, brain, bones, eyes, ears, nose, lips, chin and intraoral). Neck injuries included soft tissues, vessels and bones. All injuries were grouped according to anatomical position and classified as single or multiple.

Information abstracted from medical records included: (a) socio-demographic characterization of the victim and of the alleged abuser; (b) characteristics of the relationship between the victim and the alleged abuser, namely history of violence prior to the current episode; (c) description of the current episode of abuse, such as the mechanism of injury and information regarding the injury (anatomical site of injury, type of injury and mechanism of abuse); (d) permanent consequences. All data was collected by the same researcher to assure reliability.

Findings were recorded in a database and studied using SPSS (Statistical Package for Social Science - SPPS INC, Chicago, Illinois, USA) version 20.0, for Windows. Descriptive statistics was performed using frequency analysis for categorical variables and descriptive analysis for continuous variables. Contingency tables were created to study the relationship between two variable categories and Chi-Square test was used to verify the independence and non-existent relationship between variable categories. When more than 20% of the expected counts were less than 5, a variation of Fisher's Exact Test suitable for tables larger than 2 x 2 developed by Freeman and Halton was used with contingency tables to test for independence

and non-existent relationship between variable categories. A significance level of 5% was considered.

## Results

### Demographics

The mean age of the alleged victims was: (a) 8.79 years old for children ( $SD = 4.799$ ;  $Mdn = 10$ ; min = 0; max = 16); (b) 45.40 years old for intimate partners ( $SD = 15.568$ ;  $Mdn = 42$ ; min = 21; max = 83); (c) 72.41 years old for elders ( $SD = 5.719$ ;  $Mdn = 72$ ; min = 65; max = 86). Considering the female gender, they represent 56.9% ( $n = 128$ ) of the sample, with significant differences between the groups –  $p < .001$  (38.7% of children, 82.7% of intimate partners and 49.3% of elders).

The mean age of the alleged abuser was: (a) 37.71 years old for the children ( $SD = 10.902$ ;  $Mdn = 37$ ; min = 19; max = 70); (b) 45.99 years old for intimate partners ( $SD = 16.017$ ;  $Mdn = 42$ ; min = 21; max = 84); (c) 40.50 years old for the elders ( $SD = 11.594$ ;  $Mdn = 40.5$ ; min = 16; max = 69).

In 79.6% ( $n = 179$ ) of cases, a male individual was the alleged abuser, with no significant difference between the groups ( $p = .096$ ). The main abusers were: (a) the father in 62.5% ( $n = 45$ ) of cases, followed by the step-father, mother and step-mother (18.1%, 6.9% and 5.6%, respectively) in the children's group; (b) the current partner in 78.7% ( $n = 59$ ) of cases, whether being the husband or boyfriend, in intimate partner's group; (c) the son in 52% ( $n = 39$ ) followed by daughter, son-in-law and daughter-in-law in 14.7%, 9.3% and 6.7% respectively, in the elder's group; other alleged abusers for the elders were male nephews, grand-daughters and step-son.

Most victims lived in the same house as the abuser (82.7%;  $n = 186$ ), with no significant differences between the groups ( $p = .295$ ), and 86.1% ( $n = 194$ ) of the victims were abused in their homes, with significant differences between the groups ( $p = .006$ ) that

can be explained due to 25.3% ( $n = 19$ ) of intimate partners being abused in a different place than their homes (public places, workplace, abusers house and public venues).

Concerning the existence of DV in the family, prior to the current episode, 55.6% ( $n = 125$ ) of the victims (41.3% of children, 85.3% of intimate partners and 40% of elders) stated that physical abuse was present in their lives, with significant differences between the groups ( $p < .001$ ).

### **Mechanisms of Injuries Production**

Punching (44.4%) was the main aggression mechanism observed, followed by slapping (24.4%), beating with a blunt instrument (21.8%), pushing (20.9%), kicking (14.7%) and grabbing (13.3%). Significant differences were found in the mechanisms of aggression between the 3 groups, as shown in table 1. For instance, while for intimate partners and elders, punching was the main mechanism of aggression (61.3% and 42.7%, respectively), for children it was slapping (34.7%). Pushing was also an important mechanism of abuse, used in 22.7% of intimate partners and 33.3% of elders while for children it was only present in 6.7% of cases. Kicking was also used more frequently against intimate partners and elders when compared to children. Hair pulling or fingernail scratching were more frequently used to offend intimate partners than children or elders. Ear pulling was only used against children.

### **Location of Injuries**

The face was the most affected injury location for the three groups, representing 75.1% of all injuries, followed by skull and neck (41.8% and 8.9%, respectively). Significant differences between the groups were found in facial ( $p = .024$ ) and skull ( $p = .012$ ) locations, as resumed in table 2, for there was a smaller number of injuries to the face in the elder's group when compared to children or intimate partners while for the skull, the number of

injuries found between the groups was not similar, with decreasing proportions between the elders, the intimate partners and the children.

Considering the skull, injuries were distributed as resumed on table 2. Significant differences were found between the groups regarding the parietal area ( $p = .002$ ), for it was affected very differently according to the group considered. While frontal area was the most injured in 20% of children followed by parietal area in 8%, temporal area in 5.3% and occipital area in 2.7%, in the intimate partners group the most affected area was parietal in 13.3%, followed by frontal area in 12%, while other skull areas were injured in equal percentages (10.7%). For the elder's groups, parietal area was the most injured in 28% of cases, followed by frontal area in 22.7%, while temporal and occipital areas were injured in 2.7% and 4% of cases.

Considering the face, injuries were distributed as resumed on table 2. The cheeks were the most affected area, in 40.4% of cases, followed by the eyes in 24% of cases, lips in 19.6% of cases and ears were injured in 7.1% of cases. Intraoral injuries were found in 7.1% of cases and chin injuries in 4%. No significant differences between the groups were found. The middle third of the face was the most affected in 60% ( $n = 135$ ) of cases, followed by the lower third in 30.7% ( $n = 69$ ) and the upper third in 17.3% ( $n = 39$ ) of cases, with no significant differences between the groups ( $p = .513$ ,  $p = .304$  and  $p = .298$ , respectively).

Considering the neck, injuries were distributed as resumed on table 2. Lateral location was the most frequent, representing 8.4% of cases. Anterior location represented 3.1% of cases and posterior location 1.3%. No significant differences between the groups were found.

## Types of Injuries

Considering the types of injuries, the most frequent were bruises, representing 55.1% of the total, followed by abrasions (41.8%), oedema (30.2%), lacerations (14.2%) and

transient redness (11.6%), as resumed in table 3. Other types of injuries were present in smaller percentages, like fractures, cuts and alopecia. Transient redness was distributed between the groups with significant differences ( $p = .025$ ), with a higher frequency among intimate partners. Although not significantly different, but interesting to enhance, while for children bruises represented 64% of all injuries and abrasions and lacerations, 33.3% and 26.7%, respectively, for intimate partners bruises represented 49.3% of all injuries not as distant from the 40% of abrasions and 36% of oedemas, and elders most frequent injuries were bruises and abrasions (52%) and 30% presented oedemas. Fractures were found in four cases (one intimate partner and three elders), and were located in nasal bones, mandibular bone and maxilla and zeugmatic bones.

Most head and neck injuries were single injuries but with significant differences between the groups ( $p = .007$ ): (a) children (70.7%;  $n = 53$ ); (b) intimate partners (48%;  $n = 36$ ); (c) elders (49.3%;  $n = 37$ ).

### **Injuries Consequences**

More than half the victims, 55.1% ( $n = 124$ ) accessed health care institutions, with no significant differences ( $p = .415$ ) between the groups considered, and 52.4% ( $n = 65$ ) of them, had injuries that required diagnostic tests like x-rays and CT scans, with significant differences between the groups ( $p = .008$ ) than can be explained due to the higher number of elders that went through diagnostic tests when compared to child and intimate partner's victims (68.9%, 35.7% and 51.4%, respectively). Despite affluence to health care institutions, only 6.5% ( $n = 8$ ) of these victims were admitted as inpatients for hospital care, with no significant difference among the groups considered ( $p = .590$ ).

In all cases the forensic physician was able to establish causality between the mechanism of the injury described and the injuries observed. Healing time ranged from 1 to

235 days, but was less than 15 days for 95.1% ( $n = 214$ ) of the victims (98.7% of children, 90.7% of intimate partners and 96% of elders), with no significant differences between the groups ( $p = .176$ ).

Permanent physical consequences were present in 9.3% ( $n = 21$ ) of cases (4% of children, 8% of intimate partners and 16% of elders), with significant differences between the groups ( $p = .037$ ), and consisted mainly in scars. Bone callus was a permanent consequence in the four cases of fractures, in one case there was loss of dental structure and in another a comatose state was the aggression's result.

## **Discussion**

Whenever an individual is attacked, the head, neck and facial areas are often involved. This is because these areas are exposed and accessible, and the head is also considered to be representative of the whole person (Cairns, Mok, & Welbury, 2005). Therefore any professional that will be involved in the care of these patients should be aware and suspicious of any trauma, considering the fact that many patients will repeatedly access the healthcare system before being finally identified as DV victims.

This is the first study of this type performed in Portugal, in a forensic setting, comparing head and neck injuries between children, intimate partners and elder victims.

## **Demographics**

According to Berrios and Grady (2001) and Perciaccante et al. (1999) women younger than 45 years old are at higher risk of being abused by intimate partners and Capaldi, Knoble, Shortt, and Kim (2012) in a systematic review of risk factors for intimate partner violence focusing on victims of both genders, found that violence tends to decrease with age. Similar findings were found in our research for our median age was 42 years old and 61.3% of the

intimate partner violence victims were under 45 years old. Nonetheless, elder's abuse is a rising concern, and aging and the decline of physical mobility and mental capacities associated to it are regarded as a factor that increases the susceptibility to abuse (Friedman, Avila, Tanouye, & Joseph 2011). This argument is similar to the one used by da Fonseca et al. (1992) to explain that infants and young children are more likely to be abused because of their defenselessness, physical fragility and inability to escape from an angry parent, and lack of social contacts to keep them away from the caretaker for periods of time. In line with da Fonseca et al. (1992), Tolan, Gorman-Smith, and Henry (2006) found that infants and young children (younger than 3 years of age) suffered higher rates of abuse than older children. However in the present study, unlike findings by these author's, younger age didn't represent a larger group of abused children. This may be explained by the fact that abuse involving younger children (under school age) is less visible and therefore underdiagnosed, for these children are not brought for forensic-medical examination.

Despite the different groups of victims, in the present study, alleged abusers were usually male individuals. This may support the idea that most victims are female. According to Krug et al. (2002) women are still seen as the most important victims of DV, while men are more likely to be victims of an attack by a stranger or an acquaintance. However, there are signs that women are at least as violent as men (Capaldi et al., 2012; Straus & Gelles, 1986; Straus, 1999). One possible explanation for the seeming inconsistency between similar rates of IPV perpetrated by men and women on the one hand, and the over-representation of women among IPV victims on the other, is that violence against women may be more severe and thus may more frequently lead to hospitalization or the involvement of law enforcement agencies (Furlow, 2010). According to Carmo, Grams, and Magalhães (2011) between the years of 2007 and 2009, 11.5% of denounced cases of IPV in the Clinical Forensic Department of the North Branch of the INML, were of male alleged victims. The number of

men who were examined showed a slight tendency to increase over the 3-year period analyzed in the study, but these results may not be representative of the general population for it only reflected victims that denounced the abuse and went to the forensic-medical services. In a large number of cases, men underreport their victimization by an intimate partner for fear of embarrassment, fear of ridicule and the lack of available support services (Barber, 2008). In the present study male victims represent 17.3% ( $n = 13$ ) of intimate partners, results that concur with other studies, where female victims account for 85-100% of all victims (Caldas, Grams, Afonso, & Magalhães, 2012; Le et al., 2001). As for elder abuse victims, in the present study, 50.7% ( $n = 38$ ) were of male gender. No gender differences were found by Kleinschmidt (1997) and Pillemer and Finkelhor (1988), although findings that women suffered more serious abuse. According to Tolan et al. (2006) rates were significantly higher for those over 80 years of age and females and the rates of mistreatment among demented older persons was higher than of non-demented (Wiglesworth et al., 2010). The analysis of children's gender distribution showed a higher prevalence of male victims, 61.3% ( $n = 46$ ), that is consistent with several published studies (Cairns, et al., 2005; Cavalcanti 2010; Naidoo 2000) in spite of other studies suggesting no gender differences exists in child physical abuse (da Fonseca et al., 1992).

Research by Naidoo (2000), concluded that 88.7% of the children that were physically abused lived with the abuser, and home was the place where most aggressions took place. The main abusers were of male gender (79%), and the father or step-father was involved in 36% of cases, the mother's boyfriend in 20% and the mother in 12%. Cains et al. (2005) reported that home was the place where over half of all alleged incidents occurred, and the majority of alleged perpetrators were the child's birth parents. According to Tolan et al. (2006), parents were the perpetrators in 80% of child abuse cases. Results from the present research are similar to those obtained by previous mentioned author's, although father's

involvement as the main abuser occurred in a higher number of cases (62.5%) and the mother in a lower number of cases (6.9%), nonetheless, (birth)parents constitute the major abusers. According to Collins (2006) the large majority of elder maltreatment occurs in the home, and a community-based Boston survey by Pillemer and Finkelhor, (1988) revealed that the spouse was the abuser in 58% of the cases, a descendant in 16%, and some other individual in 18%. In our research, elder's main abusers weren't spouses because intimate partner violence was analyzed separately from abuse inflicted by other family members. Birth sons were the main abusers in 52% of cases, followed by birth daughters and son-in-law (14.7% e 9.3%), while other relatives were involved in smaller proportions.

Concerning the existence of DV in the family, prior to the current episode, 55.6% ( $n = 125$ ) of the victims stated that physical abuse was present in their lives, with significant differences between the groups ( $p < .001$ ), with a higher number of affirmative answers among intimate partners than children or elders. Despite the fact that the absence of an affirmative answer doesn't mean that physical violence doesn't exist, these differences can be attributed to a better understanding of what is physical abuse among intimate partners than children or elders. In the case of children due to their young age and the ambiguous nature of social acceptance of some corporal punishments for the purpose of correcting or controlling the child's behavior, it can be difficult for the children to differentiate between physical abuse and corporal punishment. In the case of elders, the decline of mental capacities due to advanced aging, the dependence on the caretaker and the social and self-devalue of elders may serve as an excuse to devalorize physical abuse, therefore making it somehow excusable.

### **Mechanisms of Injuries Production**

Differences were found respecting the main mechanisms of injury for the three groups considered. While punching was the main mechanism of injury for 61.3% of intimate

partners and 42.7% of elders, for 34.7% of children, the main mechanism of injury was slapping, followed by punching (29.3%). Cairns et al. (2005) reported punching and slapping in 22.5% of cases and Jessee (1995) in 32.8%. Le et al., (2001) reported punching as the favorite mean of assault in 67% of an intimate partners population and Saddki et al. (2010) reported that most common method of assault was punching (56.2%), followed by kicking (38.4%), and slapping (37.2%). No literature series on mechanisms of assault was found for the elder population.

## **Location of Injuries**

According to da Fonseca et al. (1992) and Cairns et al. (2005) in abused children the face was more injured than the head, and head was more injured than neck. In Jessee's (1995) research head and face were equally injured. In the facial area, the cheeks were the most injured location followed by eyes, ears, nose, lips and chin and despite the high number of injuries to the head and face, the reported number of intra-oral injuries was very low (da Fonseca et al., 1992). In the present study the face, head and neck were injured in decreasing proportions, however, facial injury's distribution had some differences: while cheeks were the most affected areas, the eyes and lips were affected in similar proportions, followed by nose, ears and intraoral injuries. The chin, as in da Fonseca et al. (1992) research, had few injuries and intra-oral injuries were low when compared with the high number of injuries to the head and face. As suggested and recommended by Cairns et al. (2005) and da Fonseca et al. (1992) maybe intra-oral injuries diagnose would increase if observation of the oral cavity was carried out by a professional more familiar to it, like dentists, whose involvement would then be beneficial in two ways: dentists would become more aware of their role, and would assist in the training of physicians and other professionals. No detailed literature was found on the same injuries locations for intimate partner's and the elder population, although

according to Caldas et al. (2012) 13.4% of a sample of 2489 reports of suspected IPV cases presented oral trauma (perioral soft tissue injuries including lips and intraoral injuries), a number inferior to the one appointed by the present research. This can be explained by considering the present research inclusion criteria of presenting an injury to the head or neck.

Injuries to the soft tissues of the midface and the lower third of the face were the most common form of head and face trauma among female IPV victims (Le et al., 2001; Saddki et al., 2010). In the present research the midface was involved in 60% of cases and the lower third in 30.7%.

No literature describing which head or neck areas were more injured was found for any of the groups considered.

### **Types of Injuries**

Bruising to the head, neck or face are readily detectable by any lay person and for a dentist it should raise immediate suspicion as to its etiology (Cairns et al., 2005), especially in areas that are difficult to harm accidentally as the ears or neck. Dunstan, Guildea, Kontos, Kemp, and Sibert (2002) stated that bruising to the ears, face, head and neck are seen significantly more in abused children than in control groups. According to Wiglesworth et al. (2009) a 2005 study of bruising found that accidental bruises in a geriatric population were not found on the neck, ears, genitalia, buttocks, or soles of the feet and that almost 90% of accidental bruises were on the extremities.

Bruising was the commonest presenting feature of physical abuse in children (Cairns et al., 2005; Lynch, 1975; Smith & Hanson, 1974). Research by Cairns et al. (2005) found bruising present in 95.2% of the children studied while 32.6% had abrasions. In the present research we found bruising to be the main injury type, present in 64% of children and abrasions on 33.3%. According to Maguire, Mann, Sibert, and Kemp (2005) the prevalence,

number, and location of bruises are directly linked to motor developmental ability and children with significant motor development delay would not be expected to have the same bruising pattern as their peer group. This evolving pattern needs to be taken into consideration when assessing bruising in children. In the present research the intimate partner's group showed bruises and abrasions in more approximate percentages (49.3% e 40%, respectively) while in the elder's group the same percentage of bruises and abrasions was found, 52%. Le et al. (2001) found that soft tissue injuries in the form of bruises or contusions was the most frequent injury type in a sample of female intimate partner's population, with age that ranged from 15 to 71 years old.

Fractures were present in 1.8% ( $n = 4$ ) victims, and involved in two cases the nasal bones, in one case the mandibular bone and in one case the zygomatic and maxillary bone. Le et al. (2001) found fractures in 30% of DV victims, but Saddki et al. (2010) and Caldas et al. (2012) found no fractures in their research. Differences relative to the incidence of fractures may be due to the fact that Le et al. (2001) research was performed in a trauma hospital. Da Fonseca et al. (1992) reported 10 skull fractures in his research, also performed in a hospital, while no skull fractures were reported in the present study in child victims, or any other victims. One should highlight the fact that only half the victims in the present research accessed healthcare institutions. All injuries to the skull were soft tissue injuries, although in the elders group one intracranial injury was found, without skull fracture.

### **Injuries Consequences**

No literature comparing the sought for healthcare institutions or the amount of diagnostic tests performed were found in the context of DV, for any of the groups considered. In a research by Le et al. (2001) most patients (86%) were discarded to home after the rendering of medical services. In the present study the percentage of discarded home patients

was 93.5%. The differences between our research and Le et al. (2001) can be easily explained when considering his research was conducted based on the records of a trauma hospital, therefore more potentially severe injuries should have been present.

Healing time in the present research, ranged from 1 to 235 days, but was less than 15 days for 95.1% ( $n = 214$ ) of the victims (98.7% of children, 90.7% of intimate partners and 96% of elders), with no significant differences between the groups ( $p = .176$ ). According to Carmo et al (2011) in more than 95% of the cases, the expected time for injury cure was less than nine days. We can conclude that in our research healing time periods were slightly superior to healing times in Carmo et al. (2011) research. No literature on healing times was found for children or elders.

Permanent physical consequences were present in 11.4% of cases in a retrospective study on oral injuries involving IPV by Caldas et al. (2012) and consisted mainly of scars and tooth structure loss and mobility. According to Carmo et al. (2011) 4.9% of male victims presented sequelae, which consisted in scars. Results are consistent with the ones obtained in present research where 8% of intimate partners ( $n = 6$ ) presented physical permanent consequences that consisted mainly in scars. No literature on permanent physical consequences was found for children or elders.

Significant differences were found between children, intimate partners and elders concerning permanent physical consequences, because elders presented them in a number that was twice and four times the number of permanent physical consequences presented by intimate partners and children, respectively. A possible explanation for these findings is elders' physical fragility.

## Conclusions

Considering the demographic characteristics of the involved persons, this study allowed us to conclude that:

- a) In 80% of cases the main abuser's gender was male ( $p = .096$ );
- b) While for children the main abusers were father (63%) and step-father (18%), for intimate partners was the current intimate partner (79%) and for the elders' was the birth sons (52%);
- c) Most victims (83%) lived in the same house as the abuser ( $p = .295$ );
- d) The majority of victims (86%) were abused in their homes, but intimate partners were also abused in other places in a higher number than children or elders ( $p = .006$ ).

Considering the resulting injuries and its consequences, according to the three groups:

- a) Punching was the most frequent mechanism of abuse (44%), despite statistical differences found according to the victims' group ( $p < .001$ ); the main mechanism of abuse for children was slapping (35%;  $p = .041$ ), while for intimate partners and elders was punching (61% and 43%, respectively); kicking, grabbing, hair pulling and nail scratching were more associated with intimate partner's abuse, than child or elder's abuse ( $p = .004$ ;  $p = .014$ ;  $p < .001$ ;  $p = .011$ , respectively); pushing was more frequent among elders than children or intimate partner's victims ( $p < .001$ );
- b) Some differences were found in respect to the location of injuries: face was affected among children and intimate partners in similar proportions (80% and 81%, respectively), but in a lower percentage among elders (64%); skull was more frequently affected in elders and intimate partners (53% and 43%, respectively) than in children (29%); in the face, the injured areas showed little differences between the groups ( $p = .405$ ;  $p = .599$ ;  $p = .693$ ;  $p = .500$ ;  $p = .192$ ;  $p = .045$ ;  $p = .935$ ); skull injuries locations had little differences between the groups, with exception of the parietal area that was substantially more affected in the elder's group than in the intimate partner's or children's group ( $p = .002$ ); neck injuries locations showed no differences between the groups considered ( $p = 1.000$ ;  $p = .795$ ;  $p = .775$ );

- c) Some differences concerning the type of injuries were found in respect to transient redness, that was more frequent among intimate partner's than children or elders ( $p = .019$ );
- d) Injuries consequences showed no differences between the studied groups in respect to the search for healthcare institutions ( $p = .415$ ), but the elder's group required more diagnostic test than intimate partners or children ( $p = .008$ ). Healing time was less than 15 days in 95% of cases ( $p = .176$ ). Permanent physical consequences were present in 9% of cases (4% of children, 8% of intimate partners and 16% of elders), with significant differences between the groups ( $p = .037$ ), and consisted mainly in scars.

The circumstance of similar results between the groups, with exception for the mechanisms of the physical abuse, doesn't allow us to identify any characteristics of the injuries in the head and neck to serve as markers to corroborate the diagnosis of DV cases, but we must still be alert for the fact that, as stated in literature, victims of this kind of violence are more prone to be wounded in head (especially face) and neck, and, therefore, injuries in these locations should always call our attention. There is a paucity of studies in this perspective, thus further studies are needed to better determine if there are, or not, more significant differences among these groups of victims. This could help healthcare providers and forensic physicians to timely identify evidence of abuse, which is fundamental because it is their responsibility to recognize and report any suspected situation before the escalating violence leads to more severe injury or death.

The present research had some limitations. One of the most important is its retrospective nature, which did not allow data collecting on all the variables. Also, information on the experience of violence was provided only by the victims, which may be a source of bias.

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Table 1

*Characterization of Aggression Mechanism According to the Victim's Group*

	Total MA (n; %)	Children (n; %)	Intimate partners (n; %)	Elders (n; %)	<i>p</i>
Punch	100 (44.4)	22 (29.3)	46 (61.3)	32 (42.7)	<.001
Slap	55 (24.4)	26 (34.7)	14 (18.7)	15 (20)	.041
Blunt instrument	49 (21.8)	16 (21.3)	11 (14.7)	22 (29.3)	.093
Push	47 (20.9)	5 (6.7)	17 (22.7)	25 (33.3)	<.001
Kick	33 (14.7)	5 (6.7)	19 (25.3)	9 (12)	.004
Grab	30 (13.3)	6 (8)	17 (22.7)	7 (9.3)	.014
Hair Pull	22 (9.8)	3 (4)	17 (22.7)	2 (2.7)	<.001
Nail Scratch	19 (8.4)	2 (2.7)	12 (16)	5 (6.7)	.011
Manual strangulation	19 (8.4)	3 (4)	8 (10.7)	8 (10.7)	.238
Head against wall	14 (6.2)	5 (6.7)	7 (9.3)	2 (2.7)	.273
Headbutting	10 (4.4)	3 (4)	6 (8)	1 (1.3)	.166
Cutting instrument	6 (2.7)	1 (1.3)	4 (5.3)	1 (1.3)	.373
Perforating instrument	6 (2.7)	0 (0)	2 (2.7)	4 (5.3)	.170
Ear Pull	3 (1.3)	3 (4)	0 (0)	0(0)	.108
Bite	2 (0.9)	0 (0)	1 (1.3)	1 (1.3)	1.000
Suffocate	1 (0.4)	0 (0)	1 (1.7)	0 (0)	1.000
Drown	1 (0.4)	0 (0)	0 (0)	1 (1.3)	1.000

*Note.* Categories are not mutually exclusive (not adding up to N=225 (75 for each group) or 100%)

Table 2

*Location of Injuries According to the Victim's Group*

	Total (n; %)	Children (n; %)	Intimate partners (n; %)	Elders (n; %)	p
Skull	94 (41.8)	22 (29.3)	32 (42.7)	40 (53.3)	.012
Frontal	41 (18.2)	15 (20)	9 (12)	17 (22.7)	.217
Parietal	27 (16.4)	6 (8)	10 (13.3)	21 (28)	.002
Temporal	14 (6.2)	4 (5.3)	8 (10.7)	2 (2.7)	.130
Occipital	13 (5.8)	2 (2.7)	8 (10.7)	3 (4)	.109
Face	169 (75.1)	60 (80)	61 (81.3)	48 (64)	.024
Cheeks	91 (40.4)	26 (34.7)	34 (45.3)	31 (41.3)	.405
Eyes	54 (24)	17 (22.7)	21 (28)	16 (21.3)	.599
Lips	44 (19.6)	17 (22.7)	14 (18.7)	13 (17.3)	.693
Nose	32 (14.2)	11 (14.7)	8 (10.7)	13 (17.3)	.500
Ears	16 (7.1)	9 (12)	4 (5.3)	3 (4)	.192
Chin	9 (4)	3 (4)	6 (8)	0 (0)	.045
Intraoral	16 (7.1)	5 (6.7)	5 (6.7)	6 (8)	.935
Neck	20 (8.9)	7 (9.3)	6 (8)	7 (9.3)	.947
Anterior	7 (3.1)	2 (2.7)	2 (2.7)	3 (4)	1.000
Lateral	19 (8.4)	7 (9.3)	5 (6.7)	7 (9.3)	.795
Posterior	3 (1.3)	1 (1.3)	0 (0)	2 (2.7)	.775

Note. Categories are not mutually exclusive (not adding up to N=225 (75 for each group) or 100%)

Table 3

*Type of Injuries According to the Victim's Group*

	Total (n; %)	Children (n; %)	Intimate partners (n; %)	Elders (n; %)	<i>p</i>
Bruises	124 (55.1)	48 (64)	37 (49.3)	39 (52)	.157
Abrasions	94 (41.8)	25 (33.3)	30 (40)	39 (52)	.063
Oedema	68 (30.2)	20 (26.7)	27 (36)	21 (28)	.404
Lacerations	32 (14.2)	11 (14.7)	7 (9.3)	14 (18.7)	.260
Redness	26 (11.6)	5 (6.7)	15 (20)	6 (8)	.019
Fractures	4 (1.8)	0 (0)	1 (1.3)	3 (4)	.327
Cuts/incisions	3 (1.3)	0 (0)	1 (1.3)	2 (2.7)	.775
Alopecia	2 (0.9)	0 (0)	2 (2.7)	0 (0)	.330

*Note.* Categories are not mutually exclusive (not adding up to  $N=225$  (75 for each group) or 100%)

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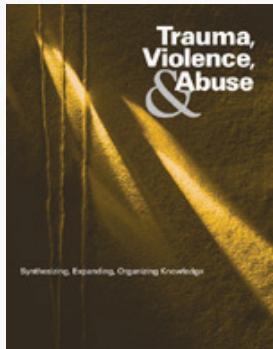
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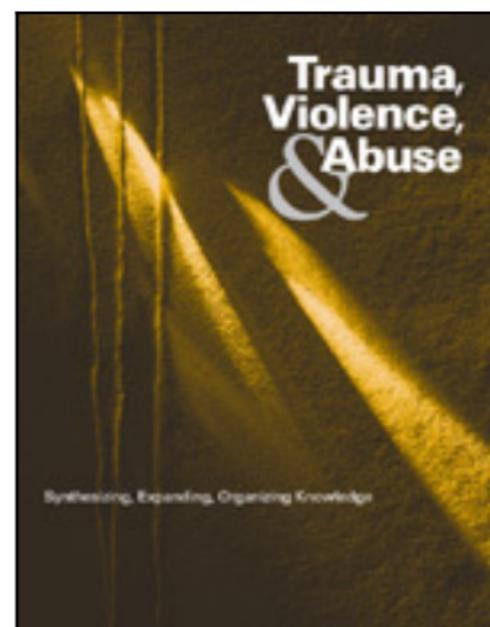
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