DOI: 10.1590/1980-5497201600040005

ORIGINAL ARTICLE / *ARTIGO ORIGINAL*

Violence against women in different stages of the life cycle in Brazil: an exploratory study

Violência contra mulheres em diferentes estágios do ciclo de vida no Brasil: um estudo exploratório

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ABSTRACT: ***Objective:*** The aim of this study was to describe the profile of violence against women in different life cycles, according to the sociodemographic characteristics of the victims and offenders. ***Methods:*** A cross-sectional and exploratory study was performed based on 1,388 police reports during a four-year period, in a metropolitan area of Northeast Brazil. The dependent variable was the type of aggression suffered by the victims. The independent variables were sociodemographic characteristics of the victims and offenders. Statistical analysis included the χ^2 test ($p < 0.05$) and the decision tree analysis, through the Chi-squared Automatic Interaction Detector (CHAID) algorithm. ***Results:*** Cases of physical abuse ($n = 644$) were the most common, followed by threat ($n = 415$) and verbal aggression ($n = 285$). The violence profiles could be explained by the relationship between victims and offenders ($p < 0.001$) and age of the victims ($p = 0.026$ in Node 1; $p = 0.019$ in Node 3). ***Conclusion:*** It was observed that women in different stages of life are more exposed to different types of violence.

Keywords: Violence. Violence against women. Life cycle stages. Public health. Epidemiology. Decision Trees.

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Conflict of interests: nothing to declare – **Financial support:** National Council for Scientific and Technological Development, Case No. 14/2010, and Support Foundation of Paraíba State Research, Notice 02/2009 Research Program for the National Health System (PPSUS).

RESUMO: ***Objetivo:*** Descrever o perfil da violência contra mulheres em diferentes ciclos de vida, de acordo com as características sociodemográficas das vítimas e dos agressores. ***Métodos:*** Estudo transversal e exploratório realizado com base em 1.388 registros de ocorrências, durante período de quatro anos, em uma região metropolitana do Nordeste do Brasil. A variável dependente foi o tipo de agressão sofrido pelas vítimas. As variáveis independentes foram as características sociodemográficas das vítimas e dos agressores. A análise estatística incluiu o teste χ^2 ($p < 0,05$) e a análise de árvore de decisão, por meio do algoritmo *Chi-squared Automatic Interaction Detector* (CHAID). ***Resultados:*** Os casos de agressão física (n = 644) foram os mais comuns, seguidos de ameaça (n = 415) e agressão verbal (n = 285). Os perfis da violência puderam ser explicados pela relação entre vítimas e agressores ($p < 0,001$) e faixa etária das vítimas ($p = 0,026$ em Nó 1; $p = 0,019$ em Nó 3). ***Conclusão:*** Foi observado que mulheres em diferentes fases da vida apresentam mais exposição a diferentes tipos de violência.

Palavras-chave: Violência. Violência contra a mulher. Estágios do ciclo de vida. Saúde pública. Epidemiologia. Árvores de decisões.

INTRODUCTION

One of the most extreme and perverse manifestations of gender inequality is through violence against women, which is a product of differences in power. It represents an important social phenomenon and a violation of human rights, significantly impacting health/sickness processes in addition to women's perspectives on life.[1,2] Violence against women covers cases that range from situations of psychological violence and threats to physical aggression.[3-5] In Brazil, the subject-matter has gained even more attention after the implementation of the federal Law number 11,340, which has the objective of punishing cases of violence between intimate partners.[6]

In the first year of effective enforcement of this law, popularly known as the Maria da Penha law, the homicide rates against women experienced a small decrease; however, they immediately started growing substantially again until 2010, when a rate of 4.6 homicides for every 100 thousand women was registered, the largest number observed in the country until then[7]. In addition, violence committed by intimate partners is one of the most prevalent types of violence in Brazilian society, with around 55% of all cases, which converts into high emotional and social costs.[8] It has also been reported that physical aggression is predominant, encompassing 44.2% of cases of violence against women assisted in the Single Health System (SUS).[7]

Various risk factors have been identified as relating to the occurrence of violence against women, including sociodemographic and socioeconomic characteristics, substance use, and history of having witnessed family violence in infancy or adolescence.[5,9] These facts demonstrate that violence against women is multi-faceted and, under a socioecological perspective, is the product of complex interactions between individuals, families, communities, and social level factors.[10]

The consequences of being exposed to violence produce physical, psychological, economic, and social impacts.[5] Problems like depression, post-traumatic stress disorder (PTSD), and suicidal thoughts have been encountered in these victims.[11,12] If the sociodemographic characteristics of the victims of violence and the aggressors are not taken into consideration, intervention proposals to minimize the resulting consequences of this social phenomenon cannot be effective.[10]

There are few studies in the literature about violence against women that deal with the differences in victimization in accordance with the cycles of life, using Police records as a data source.[4, 13] Information relative to the distribution of violence against women and the identification of the most vulnerable populations can substantially contribute to the direction of efforts destined for the creation of public policy related to surveillance, criminalization, prevention, social assistance, and rehabilitation.[5]

This study is one of the first in scientific literature that tried to trace the profile of violence against women in accordance with sociodemographic characteristics of the victims and aggressors through employment of the multivariable model of the decision tree, the *Chi-squared Automatic Interaction Detector* (CHAID), which is a promising instrument for approaches to public health.

METHODS

A cross-sectional and exploratory study was performed with the data from a Police station specialized in attending to women, who are victims of violence, located in a metropolitan region in the Northeast of Brazil, which has a population of 687,545 habitants, in accordance with the 2010 census.[14]

All of the records of the victims that sought out the police station for having suffered physical and/or verbal violence were adopted as inclusion criteria during a period of four years (January 2008 to December 2011). The records that were inaccessible in the moment of collection because of judicial questions were excluded. Besides this, because the filling out of the records is by hand, the ones that were illegible, even after consulting an employee from the sector, were also excluded. During data collection, care was taken to observe the existence of repeated complaints with the goal of avoiding of the same case twice in the sample. The explicit recommendations in the *Strengthening the Reporting of Observational Studies in Epidemiology* (STROBE) Declaration for observation studies were followed.

Before the data collection, a pilot study trying to adapt the form to be used was done. Three components of the team were subjected to calibration procedures for collecting data. The intra- and inter-examiner agreements were evaluated using the Kappa test, and both obtained K = 0,85 – 0,90, which are considered very good, allowing for the examiners to perform the study.

For data collection, a specific form was created with variables related to the sociodemographic characteristics of the victims (age, education, occupation, region where lived) and

of the aggressors (sex, age, occupation, region where lives, and connection to the victim) and the violence characteristics (type, circumstance of aggression, day and period of occurrence). Age range was categorized into three subcategories: young adults (15–29 years old), adults (30–59 years old), and old people (elderly) (60 years old or more), with the objective of making the comprehension of the multivariate analysis results easier.

Physical violence was understood as cases, in which the victims were pushed, beaten, kicked, pulled by the hair, dragged, burned, or assaulted with an instrument. Verbal violence was characterized by situations of insult and humiliation. The cases of threat involved situations in which the aggressor psychologically abused the victim, threatening to assault her physically, torture her, kill her, or prevent her from visiting family and friends or make telephone calls to them.

Initially, the absolute frequencies and percentages of all the variables being studied were calculated. Afterward, a two-variable analysis was performed to test the association of all of the independent variables in relation to the type of aggression (physical and/or verbal, threat) utilizing the χ^2 test. Finally, trying to trace the profile of violence against women, all of the variables were inserted in a tree decision model through the CHAID algorithm, with the objective of identifying which explained the different types of aggression the most. Only the variables that obtained a p value adjusted < 0.05 remained in the final graph.

This method consists of decision rules that perform successive divisions throughout all of the data, in a way that makes it more and more homogenous with respect to a dependent variable. The decision tree utilizes a graph that begins with a root node, in which all of the observations from the sample are presented. The nodes produced in sequence represent the subdivisions of the data in groups that become more and more homogeneous, denominated as children nodes. When there is no more possibility for division, the nodes are called terminal nodes or leaves. [15]

The model was adjusted by means of successive binary divisions (nodes) throughout all of the data. The stop criteria that was adopted with the value $p < 0.05$ of the statistic χ^2 using the Bonferroni correction. The adjustment to the final model was evaluated by the estimation of general risk, which compares the differences between the expected value and the observed value through the model, indicating in which measures the tree correctly predicts the results.

The study was evaluated independently by a Research Ethics Committee and approved (n. º 02266.0.133.000-10). All of the rights of the victims were protected and all of the national and international precepts of research ethics with human beings were followed.

RESULTS

Around 1,388 police records of violence against women were analyzed. Cases of physical aggression predominated (n = 644), followed by threat (n = 415) and verbal

aggression (n = 285). Table 1 shows the distribution of type of aggression (physical, verbal, and threat) according to sociodemographic characteristics of the victims. No significant statistical difference was verified of the level $p < 0.05$: age group ($p = 0.144$), education ($p = 0.291$), occupation ($p = 0.615$), and region lived ($p = 0.628$). Table 2 presents the distribution of type of aggression (physical, verbal, and threat) conforming to the sociodemographic characteristics of the aggressors, the circumstance, and the period of occurrence. Significant statistical difference was only verified for the variable connection of aggressor with the victim ($p < 0{,}001$), the rest of the variables presented a significance level higher than 0.05: sex ($p = 0.363$), age group ($p = 0.362$), occupation ($p = 0.379$), and region where lives ($p = 0.389$). In addition, no significant statistical difference was observed in the circumstances of aggression ($p = 0.122$), the day of the aggression ($p = 0.453$) or in the period of occurrence ($p = 0.689$).

Eight nodes constructed the final model of the decision tree. Figure 1 shows the multivariable analysis by means of the decision tree (CHAID) for violence against women

Table 1. Distribution of type of aggression (physical, verbal, and threat) according to sociodemographic characteristics of the victims.

Variable	Type of Aggression							
	Physical		Verbal		Threat		Total	p-value
Categories	n	%	n	%	n	%		
Age group (1,264)* (years)								
15 – 29	220	46.0	89	18.6	169	35.4	478	0.144
30 – 59	347	48.6	162	22.7	205	28.7	714	
60 or more	35	48.6	16	22.2	21	29.2	72	
Education (1,077)* (years)								
≤ 8	275	48.2	131	23.0	164	28.8	570	0.291
> 8	239	47.1	102	20.1	166	32.7	507	
Occupation (1,236)*								
Has a salary	99	46.7	49	23.1	64	30.2	212	0.615
Doesn't have a salary	186	510	72	19.7	107	29.3	365	
Doesn't work	307	46.6	137	20.8	215	32.6	659	
Region where lives (1,330)*								
Urban zone	612	47.9	272	21.3	394	30.8	1278	0.628
Suburbs	24	46.2	9	17.3	19	36.5	52	

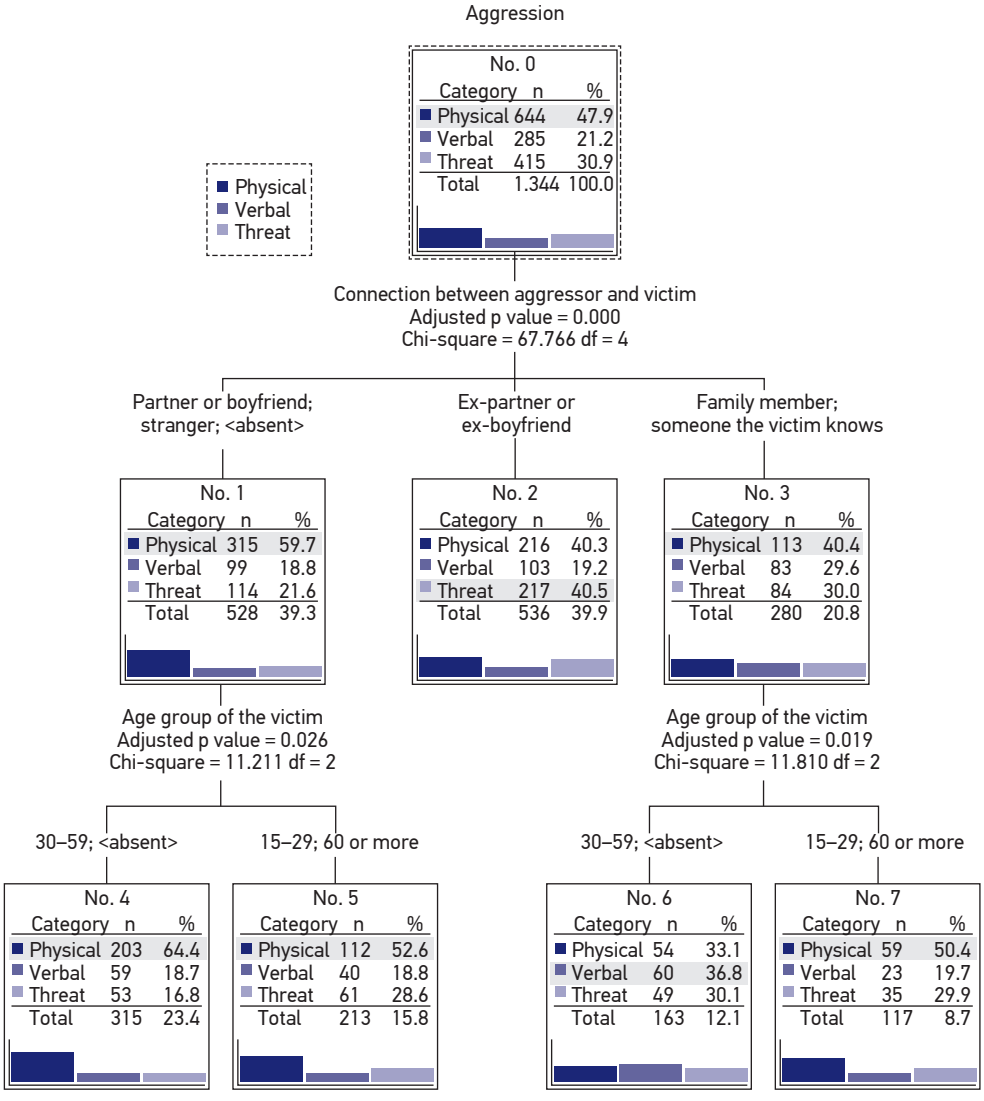
*The values in parentheses indicate the number of valid cases for each variable. The differences in the total category are due to *missing data*.

Table 2. Distribution of type of aggression (physical, verbal, threat) according to sociodemographic characteristics of the aggressors, the circumstance, and the period of occurrence.

Variables	Type of Aggression							
	Physical		Verbal		Threat		Total	p-value
Categories	n	%	n	%	n	%		
Sex (1318)*								
Feminine	37	42.0	18	20,5	33	37.5	88	0.363
Masculine	593	48.2	263	21,4	374	30.4	1,230	
Age group (1072)* (years)								
15 – 29	159	46.9	63	18,6	117	34.5	339	0.362
30 – 59	336	47.8	154	21,9	213	30.3	703	
60 or more	14	46.7	9	30,0	7	23.3	30	
Occupation (1070)*								
Has a salary	154	49.7	60	19.4	96	31.0	310	0.379
Doesn't have a salary	274	45.4	136	22.6	193	32.0	603	
Doesn't work	84	53.5	29	18.5	44	28.0	157	
Region where lives (1,236)*								
Urban zone	567	47.4	252	21.1	376	31.5	1,195	0.389
Suburbs	19	46.3	12	29.3	10	24.4	41	
Connection with victim (1,317)*								
Partner	283	59.0	91	19.0	106	22.1	480	< 0.001
Ex-partner	216	40.3	103	19.2	217	40.5	536	
Family member	75	41.9	50	27.9	54	30.2	179	
Someone the victim knows	38	37.6	33	32.7	30	29.7	101	
Stranger	16	76.2	2	9.5	3	14.3	21	
Circumstance (1,175)*								
Domestic	385	47.4	182	22.4	246	30.3	813	0.122
Community	183	50.6	62	17.1	117	32.3	362	
Day of occurrence (1,217)*								
Days of the week	375	46.5	181	22.4	251	31.1	807	0.453
Weekends	206	50.2	84	20.5	120	29.3	410	
Period of Occurrence (1007)*								
During the day	230	47.7	108	22.4	144	29.9	482	0.689
At night	259	49.3	106	20.2	160	30.5	525	

*The values in parentheses indicate the number of valid cases for each variable. The differences in the total category are due to *missing data*.

(physical aggression, verbal aggression, and threat) adjusted for sociodemographic factors. It was found that the type of aggression that women suffer can be explained by the connection between aggressor and victim ($p < 0.001$) and age group of the victim ($p = 0.026$ in Node 1; $p = 0.019$ in Node 3). Three distinct groups were formed to explain aggression and the connection between aggressors and victims of this study: perpetrated aggression by the



Df: degrees of freedom.

Figure 1. Multivariate analysis using the decision tree *Chi-squared Automatic Interaction Detector* (CHAID) for violence against women (physical aggression, verbal aggression, and threat), adjusted for sociodemographic factors.

partner/boyfriend or a stranger (n = 528; 39.3%), by the ex-partner/ex-boyfriend (n = 536; 39.9%), and by family or people they know (n = 280; 20.8%).

DISCUSSION

The results showed that the most common type of violence against women corresponded to physical aggression, which is consistent with the results of another study performed in a Police Station Specialized in Assisting Women (DEAM) in the Brazilian state of São Paulo, which identified physical aggression as the type of violence most commonly reported.[16] But both physical abuse and psychological abuse can negatively impact women's health and quality of life.[2,5] However, it is necessary to combat and outline the subject of violence against women within all organizational levels of society, in such a way to involve individuals, families, communities, and the different social levels at the same time.[2]

Cases of domestic violence against women remain prevalent. In Brazil, it has been reported that approximately 70% of situations of violence against women occur in the victim's own residence.[7] The prevalence of domestic violence identified in the present study was greater than that found in studies done in Romenia[5] (56.3%) and in Saudi Arrabia[17] (34%). As such, access to services, which offer attention, and support to the victims becomes fundamental.

In the distribution of types of aggression between younger women, in an age range of 15–29 years, adult women, in an age range of 30–59 years, and older women, with an age of 60 years or more, differences in victimization arise in accordance with life cycles, which agrees with previous studies from the literature.[4,13]

The average age of the victims was 35.72 (standard deviation – SD = 12.98; minimum 15 years; maximum: 94 years). Other studies developed in Brazil reported that adult women, generally between 20 and 49 years of age, represent the main victims of violence.[4,16] This age range is characterized by an important life stage of the women, with relation to their reproductive period and their attention and care for their children. A participant population survey from *Multi-country Study on Women's Health and Domestic Violence against Women*, which included 790 women who live with children from 5 to 12 years old, residents of the municipality of São Paulo, SP, and in Zona da Mata in Pernambuco, showed that there can be repercussions of the violence against the women in the behavior of the children, indicating the need to adopt effective measures to confront it.[19]

Women with low levels of education reported a greater physical aggression victimization in comparison with women with higher educational levels; however, there was not a statistically significant difference.[1,2,5,10,19] It is probable that women with a higher level of education have more access to information and resources, and as such, are less tolerant of a relationship marked by abusive situations.[10] Or, because of the fear of reporting, the possibility exists that many cases are underreported.

A study done in two Brazilian regions as part of the WHO *Multi-country Study on Women's Health and Domestic Violence against Women,*[19] identified that having up to eight years of schooling was one of the factors associated with the occurrence of violence by an intimate partner. Similar results were found by a multicentric study by the World Health Organization (WHO) conducted through population-based surveys in Bangladesh, Brazil, Ethiopia, Japan, Namibia, Peru, Republic of Tanzania, Samoa, Serbia, and Montenegro, Thailand, which stressed the association between the woman or partner finishing secondary school and the decrease in intimate partner violence.[20] In this scene, the role of education and the economic empowerment become notable in the context of social transformations centered around overcoming gender inequality and decreasing the levels of violence[1]. It was not possible to analyze the differences in the levels of education between aggressors, which could constitute another factor in the association between education and violence against women.

A higher prevalence of physical and verbal violence and threats was observed among women who did not work in comparison with economically independent women, although a statistically significant difference has not existed. It is estimated that economically dependent women have a 1.5 times higher probability of being physically abused by her partner.[17] Although the majority of causes of violence against women have been concentrated in urban zones, no statistically significant association was verified for any specific subcategory of violence. In this region, the agglomerate of people is greater than the agglomerate of cities that make up the sub-urban zone. Besides this, another point to highlight is that residents' access to police stations in sub-urban regions is more difficult, as such there could be underreporting of violence in these areas. An extremely useful tool in these cases is geoprocessing.

Almost all of the aggressors were men (93%), confirming previous findings from the literature that say that women are more assaulted by men, and in the majority of cases have an intimate relationship with the victim.[16] This result can be understood upon analyzing the problematic nature of the violence, keeping in minds questions of gender in Brazilian society. Men are still highly characterized by sexist practices and are present in the context of violence in different places, as they are the products and targets of subjectivity standards guided by models of gender and by unequal power relations.[21-23] In Brazil, these issues are enhanced by the notorious socioeconomic inequalities of the population.[24] However, public managers should plan programs that involve men who have used violence against women, aiming to prevent it and minimize its repercussions in the health indicators of the population.

One of the peculiarities of the present study relates to the fact that the connection that the aggressor as with the victim seemed to influence in the type of aggression that was perpetrated.[4,16] From 20 to 50 years of age, partners represent the main aggressor agents, while over 60 years old, family members (especially children) and people they know (generally the caretakers) stand out in terms of the aggressor agent.[7]

With the objective of tracing the profile of violence against women in accordance with sociodemographic characteristics of the victims and aggressors, a multivariable model was constructed using a decision tree (CHAID). The use of this analysis is relatively new

in investigations in the area of epidemiology and public health, as it is considered quite promising for the identification of populations at risk.[25] It is characterized by a data mining technique in which there is the systematization of the data with the purpose of obtaining decision making, which seems to be appropriate for epidemiological monitoring activities in health, since it can be directioned to conditions on the individual and population level.[26]

Subject-matter like profile of teeth loss in adults according to social capital,[26] risk factors for incidents of smoking,[27] and quality of life[28] have been addressed recently by means of a decision tree analysis. In the present study, the profile of violence against women may be explained by differences in relation to age range of the victims and the relationship they had with the aggressor. Observing the chart through the terminal nodes or leaves, the formation of three profiles was verified. The first profile was formed by adult women (30–59 years old) who suffered from physical aggression from their partner/boyfriend or from a stranger. In Rada's study, it was found that 24–43% of people experienced some form of violence by an intimate partner during their lives.[5]

In developing countries like Brazil, violence committed by intimate partners is one of the most prevalent modalities, nevertheless many cases are not identified, and no type of reception, assistance, support, or referral is performed.[29] Coming from a socioecological perspective, the violence can be understood as a product of interaction between individuals, families, communities, and social level factors, producing physical, mental, and social harm among its victims. Therefore, integrative and participatory community approaches can facilitate the incorporation of voices and perspectives of women in programs aimed at reducing intimate partner violence.[10]

Different theoretical models can be used with the purpose of understanding why violence occurs in intimate relationships. Psychopathological models, sociological system theories of gender and family can be cited. Among them, the sociological theories show that low levels of education, socioeconomic condition, stress, lack of support from authorities (health services and social well-being), and a closed social network contribute to a larger occurrence of intimate partner violence.[9] The exposition of violence perpetrated by a partner may can bring up feelings of hatred and disaffection toward him. In tense situations, women tend to report symptoms of headaches, depression, and other mental disorders, like suicide attempts.[2]

Profile 2 was formed of women who suffered threats from their ex-partner or ex-boyfriend. These results coincide with the observations in another study developed in a specialized police station in Minas Gerais, where threats constituted the most frequent type of violence against women.[4] Exposure to threat and abusive language can result in frustration and social isolation.[2] This highlights the importance of prevention and intervention measures, because these women are vulnerable to suffer from physical aggression or even death.

Profile 3 was formed of young women from 15 to 29 years and older, women of 60 years old or older, who suffered physical aggression from family members or people they knew. A study with a basis in Notafiable Diseases Information System (SINAN) verified that violence against elderly Brazilians is more common among women without marital interaction

and are usually abused in the domestic sphere by people living with them. [30] These results call attention to the fact that in Brazil, an increase in the number of elderly people with the possibility of reaching older and older age groups has been observed, leading to changes in social policies and constituting major public health challenges.[31] Therefore, knowing the different manifestations of violence against the elderly population could support actions to face it, identifying vulnerability characteristics in which support networks can act efficiently.[32]

In the last few years, the creation, articulation, integration, and consolidation of protection plans and networks and the guarantee of elderly people's right in Brazil has been observed.[33,34] Concrete actions are fundamental, keeping in mind that the elderly population grows quickly and situations of abuse and mistreatment become more and more evident. In this way, tracking cases of violence against elderly people and understanding the contextual and situational factors associated with it becomes crucial, and health professionals acting in the Family Health Strategy (ESF) are key pieces of this scene.

In function of the cross-sectional nature of the methodological design of this analysis, it was not possible to establish a causal relationship. Aside from this, the results should be interpreted with caution, because they highlight only a piece of the events, referring to the cases in which the victims decided to report the abuse to the police. Representative population studies and studies that deal with the occurrence of sexual violence should be performed, with the objectives of amplifying the existent knowledge about violence against women, evaluating the need for health services and contributing to the planning of intersectional actions to face this serious public health problem and violation of human rights.

On the other hand, the results obtained provide relevant information about the occurrence of violence against women and open space for discussion about new issues that could be addressed in future studies. The use of a decision tree analysis in the study of violence against women is innovative and very useful, because the natural hierarchy of the graph that was generated allows the researcher to map the final results, identify the determinant factors, and visualize subgroups of individuals with specific profiles that can be approached in the future by heath services and social assistance in a more direct way, something that is not always possible with the use of classical statistical techniques. Consequently, it is a very promising method to analyze data coming from epidemiological studies and public health, providing useful information to guide decision-making and support the planning of actions and public policies.

CONCLUSION

It was verified that differences in the forms of victimization of violence against women exist in accordance with the life cycles for the population being investigated. As such, the studies and health actions should consider the fact that women in different phases of life are more exposed to different types of violence.

It is vital that health professionals are attentive to the signs that emerged, not only physical aggression, but also psychological. The acknowledgment of violence against women as an important public health problem and a serious violence of human rights makes the adequate allocation of resources for the expansion of social care centers for victims of violence necessary. The current panorama requires an urgent look into all of the levels of political, social, judicial, and health organization.

ACKNOWLEDGMENTS

The authors thank the Specialized Women's Police Station (DEM) from the municipality of Campina Grande, PB, Brazil, for the authorization of the management of data acquisition.

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Received on: 04/21/2015
Final version presented on: 06/14/2016
Accepted on: 06/15/2016