



RESEARCH ARTICLE

Association between sleep disorders and child violence assessed in Southern Brazil

Associação entre distúrbios do sono e violência infantil avaliada no Sul do Brasil

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Received on: Nov. 2nd, 2020.

Approved on: Aug. 26th, 2021.

Published on: Sep. 29th, 2021.



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Abstract

Aims: identifying sleep disorders (SDs) in children who experienced child maltreatment.

Methods: the study evaluated the sleep pattern of 123 children (from 2 to 10 years old), who received assistance with child maltreatment, based on the Children's Sleep Habits Questionnaire (CSHQ) – applied in a medical consultation after confirmation of the veracity of the child's report of a violation. The study applied the questionnaire to children seen by doctors in the sector for 11 months.

Results: among the children evaluated, 66.7% had SDs. The sample profile was predominantly female (59.3%) and aged between 4 and 7 years old (48.8%). Physical violence was found in 40.7% of the children, in addition to sexual (35.8%), psychological (24.4%), negligence (14.6%) and other types of violence (OTV) (4.5%). SDs are significantly associated with sexual, psychological and OTV ($p=0.016$). Regarding the subscales, there was a significant difference between the age groups in the bedtime resistance (BR) factor score ($p=0.033$). The BR characteristic typifies sexual, psychological and OTV. Sleep anxiety (SA) typifies more psychological, sexual and OTV. Night awakenings (NAs) typify psychological, sexual and physical violence. According to the type of violence, significant differences were found in SA ($p=0.039$), NAs ($p=0.026$) and BR ($p=0.004$).

Conclusions: the outcomes highlight the association between SDs and child maltreatment. Certain types of violence have a greater negative impact on children's sleep and correlate with specific SD.

Keywords: sleep disorders, child abuse, child maltreatment, domestic violence, sexual abuse.

Resumo

Objetivos: identificar distúrbios do sono em crianças que sofreram maus-tratos infantis.

Métodos: o estudo avaliou o padrão de sono de 123 crianças (de 2 a 10 anos) atendidas por relatos de maus-tratos, com base no Questionário de Hábitos de Sono Infantil (CSHQ) – aplicado em uma consulta médica após confirmação da veracidade do relato de violação da criança. O estudo aplicou o questionário a crianças atendidas no setor durante o período de 11 meses.

Resultados: dentre as crianças avaliadas, 66,7% apresentavam distúrbios do sono. O perfil da amostra foi predominantemente feminino (59,3%) e com idade entre quatro e sete anos (48,8%). Violência física foi encontrada em 40,7% das crianças, além de sexual (35,8%), psicológica (24,4%), negligência (14,6%) e outros tipos de violência (4,5%). Os distúrbios do sono estão significativamente associados à violência sexual, psicológica e a outros tipos de violência (OTV) ($p=0,016$). Em relação às subescalas, houve diferença significativa entre as faixas etárias nos escores de resistência em ir para a cama ($p=0,033$). A característica resistência em ir para a cama tipifica a violência sexual, psicológica e OTV. Ansiedade do

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sono típica mais a violência psicológica, sexual e OTV. O despertar noturno típica a violência psicológica, sexual e física. De acordo com o tipo de violência, foram encontradas diferenças significativas na ansiedade do sono ($p=0,039$), despertar noturno ($p=0,026$) e resistência em ir para a cama ($p=0,004$).

Conclusões: os resultados evidenciam a associação entre distúrbios do sono e violência infantil. Certos tipos de violência têm um impacto negativo maior no sono infantil e se correlacionam a distúrbios do sono específicos.

Palavras-chave: distúrbios do sono, abuso infantil, maus-tratos infantis, violência doméstica, abuso sexual.

ABBREVIATIONS: BR, bedtime resistance; CSHQ, Children's Sleep Habits Questionnaire; NAs, night awakenings; OTV, other types of violence; SA, sleep anxiety; SDS, sleep disorders; SDB, sleep-disordered breathing; SOD, sleep onset delay.

Introduction

The World Health Organization defines *violence* as "the intentional use of force or physical power against another person that results (or is highly likely to result) in injury, death, psychological damage or inadequate development" (1). Violence is a complex phenomenon, associated with specific socio-cultural and political contexts and dynamics (2).

In its report (1), the World Health Organization classifies violence against children into physical abuse, sexual abuse, psychological abuse and neglect. Among them, neglect is prevalent (50%), followed by physical abuse (33.3%), psychological abuse (8.3%) and sexual abuse (8.3%) (3, 4). One example of the manifestation of the latter is a study that assessed the profile of children and adolescents who have suffered sexual abuse in Rio Grande do Sul which has shown that 39.35% of them were between 10 and 14 years old, followed by 30.64% who were between 5 and 9, with a predominance of girls (5).

Furthermore, mistreatment at an early age has a greater negative impact: increased anxiety, depressive disorders, aggressiveness and withdrawn behavior, suicidal thinking and/or intention, eating disorders, sleep disorders (SDs) and behavioral problems such as bullying and rule-breaking habits (4, 6-9). It is important to highlight that the violence must also be identified according to emotional or nutritional deprivation as well as reports of developmental failures, weight changes and schooling problems (3).

More specifically, disruptive nocturnal behaviors are considered a class of SDs that includes nightmares, night terror and dream-enacting behaviors. According to the study carried out by Cecil et al., with an age range between 16 to 24 years old, disruptive nocturnal behaviors have been associated with females and older age (10). Also, emotional, and sexual abuse has been associated with disruptive nocturnal behaviors, with a greater association with the emotional effect (8, 10).

In addition, several studies have reported SDs in children who were exposed to trauma, especially in those who have experienced child violence ranging from 16% to 40% of occurrence. About 20% to 30% of children have experienced nightmares and 20% to 43% have difficulty sleeping (8).

There are several symptoms of SDs, the fear when going to sleep in the dark being the one that has appeared the most. It has been observed in 23.4% of the abused children, while 13.9% of the non-abused children have also presented such alteration. Symptoms of night terror make up 1.8% versus 0.5%; those of nightmares, 4.4% versus 1.7%; those of early awakening, 3.7% versus 1.9%; and those of daytime sleepiness, 9.9% versus 6.9%. Moreover, SDs are highly prevalent among sexually abused individuals, particularly females in adulthood, and are manifested in an increase of awakenings, nighttime movement, sleep paralysis, nightmares, and insufficient sleep (11, 12).

Additionally, when dealing with sociodemographic information about the association between child sexual abuse and SDs in preschoolers, there have been negative associations between SDs, maternal age and their education level (12).

Furthermore, according to the study carried out by Baiden et al., about 11% of men and 17% of women who experienced childhood adversity have shown changes in their daily sleep patterns. It has also been evidenced that 14.2% of the interviewees had disturbed sleep. Among the most prevalent adversities, 40.3% of physical violence, 16% of domestic violence and 10% of situations of sexual violation have been found (13).

Lastly, it is worth highlighting that SDs in adulthood are related to excessive alcohol

consumption, personality disorders, attention deficit and hyperactivity disorder (and several other reasons). They also show a correlation with obesity, chronic respiratory disease, stroke, heart disease, cancer and diabetes (13,14). Child abuse has already been linked to smaller total brain size, leading to synaptic changes and reduced brain activity on electroencephalograms (15). Hence the importance of an early assessment of SDs among children.

Thus, the present study aimed to identify SDs and their characteristics in children who have been victims of child violence. Therefore, its goal is to assist in the prevention and the onset and aggravation of diseases (13).

Methods

The study protocol has been approved by the Ethics Committee of the Lutheran University of Brazil, under the number 3.291.302. Ethical principles are following resolution number 466/2012 of Brazil's National Health Council. The study has preserved the participants' anonymity as well as not taken any damage or risks to them.

This is a descriptive observational cross-sectional study with a target population of children between 2 and 10 years old, victims of child violence or exposure to home violence who have received care by the Reference Center for Child and Adolescent Care in the University Hospital of Canoas. The period of medical care appointments comprised 11 months, with a retrospective collection from October 2018 to August 2019. Children's Sleep Habits Questionnaire (CSHQ) was applied only at the child's first appointment.

The CSHQ is a retrospective tool answered by children's parents or legal guardians to assess sleep behavior in school-age children. The questions were selected to include the presence of symptoms of the most common childhood SDs, according to the International Classification of Sleep Disorders. The questionnaire was the chosen research instrument, with the addition of five questions: age (years), sex, use of medications and/or diagnosis of psychiatric disorders and types of violence suffered (1, 16). The collection of information through the questionnaire has been

performed by a medical professional who was registered in an electronic medical record, having parents or companions as an informant source. The answers to the inferred questions have been based on the children's sleep habits during the week before or during a recent typical week.

Quantitative variables (age in years), qualitative variables (male or female) and categorical variables (types of violence suffered — physical violence, sexual violence, psychological violence, neglect and other forms of violence — which, in this study, only accounted cases of exposure to domestic violence) have been considered. The type of violence was classified based on the guide for managers and health professionals for the Ministry of Health (17). In order to analyze the data obtained through the CSHQ, the variables were grouped into eight subcategories: bedtime resistance (BR), sleep onset delay (SOD), sleep duration, sleep anxiety (SA), night awakenings (NAs), parasomnias, sleep-disordered breathing (SDB) and daytime sleepiness. The exclusion criteria have been the existence of developmental or psychiatric disorders (such as attention deficit and hyperactivity disorder and autism spectrum disorder) or the use of medication (psychostimulants, anticonvulsants or antihistamines) that might impact sleep (1, 16).

Regarding the statistical methodology, descriptive statistics have been used to present the results through absolute and relative frequencies, minimum and maximum values, arithmetic means and respective standard deviations. The distribution of the scores of the variables resulting from the application of the CSHQ has been tested for normality using the Kolmogorov-Smirnov test. The existence of associations between the presence of SDs with the types of violence, sex and age groups has been analyzed by using the Chi-Square test.

The comparison of factor scores and the total CSHQ score between sexes and types of violence has been performed by using the Mann-Whitney test and, between age groups, the Kruskal-Wallis test. All statistical procedures have been performed by using the IBM SPSS Statistics

24, adopting a significance level of $p \leq 0.05$. The sample size calculation has been based on the number of monthly appointments of the analyzed age group — an average of 24 visits per month — with a minimum total of 117 children.

Results

The research population comprised 129 children, victims of child violence or exposed to domestic violence, who were treated at the reference center. Six children have been excluded from the research due to the diagnosis of developmental or psychiatric disorder or the use of medication (psychostimulants, anticonvulsants or antihistamines). The sample profile has shown a predominance of girls 59.3% ($n=73$) and an age ranging from 2 to 10 years old with an average of 6.2 ± 2.4 years old. The most prevalent age range has been between 4 and 7 years old 48.8% ($n=60$). Nearly two-thirds of the sample 66.7% ($n=82$) presented SDs.

Among the types of violence, we have found physical violence in 40.7% ($n=50$) of the children,

followed by sexual violence 35.8% ($n=44$), psychological violence 24.4% ($n=30$), neglect 14.6% ($n=18$) and other types 4.1% ($n=5$). The number of occurrences has been calculated based on the sample size ($n=123$ cases) and each type of violence in each sample case has been counted, totaling 102 (82.9%) children who have suffered only one type of violence. Only one child has been identified with violence in three categories of the types of violence.

Regarding the SDs in relation to the variable gender and children's age groups, no significant association has been found ($p=0.092$ and $p=0.747$ respectively). As for the sleep domains (BR, SOD, sleep duration, SA, NAs, parasomnias, SDB and daytime sleepiness), significant differences between the sexes in the daytime sleepiness subcategory ($p=0.011$) and the total CSHQ score ($p=0.029$) have been found. In addition, there has been a significant difference between the age groups in the sleep domain subscales in the BR factor ($p=0.033$) (**Table 1**).

TABLE 1 – Results of CSHQ scores by type of violence ($n=123$).

	Sexual $n=38$	Physical $n=33$	Multiple Notification $n=22$	Psychological $n=21$	Neglect $n=6$	Others $n=4$	p^*
BR	11.6 \pm 3.3	9.6 \pm 3.3	8.5 \pm 2.3	11.0 \pm 3.2	7.3 \pm 1.2	11.0 \pm 5.8	0.004
SOD	1.5 \pm 0.7	1.6 \pm 0.8	1.9 \pm 1.0	1.8 \pm 0.9	1.3 \pm 0.8	1.5 \pm 0.6	0.578
Sleep duration	4.3 \pm 1.5	4.4 \pm 1.7	4.1 \pm 1.7	4.5 \pm 2.2	3.7 \pm 0.5	4.5 \pm 1.9	0.884
SA	7.5 \pm 2.5	6.4 \pm 2.6	6.4 \pm 2.4	7.9 \pm 2.9	4.8 \pm 1.6	7.3 \pm 3.0	0.039
NAs	4.3 \pm 1.3	4.3 \pm 1.4	3.7 \pm 0.9	4.4 \pm 1.0	3.0 \pm 0.0	3.5 \pm 1.0	0.026
Parasomnias	10.5 \pm 2.1	9.5 \pm 2.3	10.1 \pm 2.6	10.1 \pm 2.5	8.2 \pm 1.0	9.0 \pm 0.8	0.118
SDB	3.9 \pm 1.2	3.7 \pm 1.5	3.9 \pm 1.4	4.7 \pm 1.9	3.0 \pm 0.0	4.3 \pm 1.5	0.067
Daytime sleepiness	15.7 \pm 3.6	14.8 \pm 2.7	14.5 \pm 2.4	15.8 \pm 3.0	16.2 \pm 2.9	15.5 \pm 4.4	0.508
CSHQ	55.0 \pm 8.0	51.0 \pm 8.7	50.1 \pm 6.5	55.9 \pm 7.5	45.5 \pm 3.9	52.5 \pm 7.6	0.004

BR, bedtime resistance; CSHQ, Children's Sleep Habits Questionnaire; NAs, night awakenings; SA, sleep anxiety; SDB, sleep disorders breathing; OD, sleep onset delay. *Kruskal Wallis test.

Regarding the results of the CSHQ scores by type of violence, there has been an association between physical violence and the following

characteristics: BR ($p=0.011$), sleep anxiety ($p=0.046$) and score in the QSHQ ($p=0.011$). Sexual violence has been associated with BR ($p=0.021$)

while psychological violence has been associated with changes in the sleep onset delay ($p=0.028$) and SDB ($p=0.043$). Finally, neglect has been associated with BR ($p=0.002$), SA ($p=0.021$), NAs ($p=0.009$) and QSHQ score ($p=0.013$). As for the other types of violence (OTV), there have been no significant associations

In order to assess the SDs according to the type of violence, only single cases by type of

violence (rule of mutually exclusive sets) have been considered, to avoid bias in cases with two or more types of reported violence, leaving a specific sample of 102 cases ($n=102$). SDs have been significantly associated with sexual and psychological violence as well as other forms of violence ($p=0.016$) while regarding physical violence and neglect, there has been a lower prevalence of SDs (**Figure 1**).

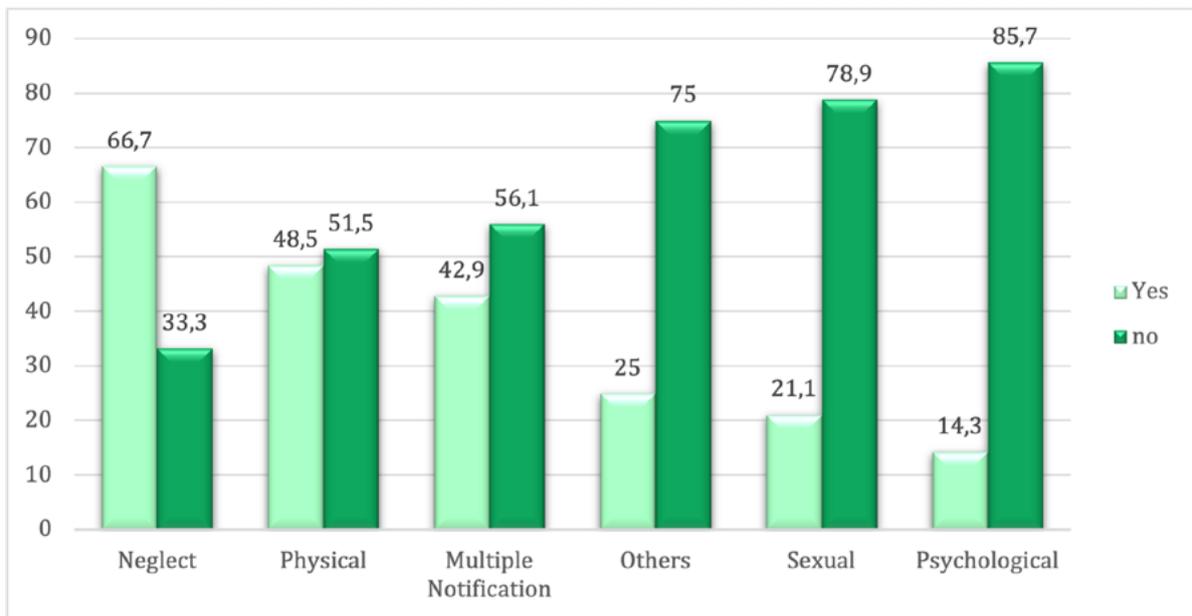


Figure 1 – Prevalence (%) of sleep disorders by type of violence ($n=123$). Sleep disorders are associated with types of sexual and other types of violence ($p=0,016$). Analysis based on the Kruskal Wallis test.

Presented in **Table 1**, BR typifies violence: sexual (11.6 points), psychological and other types (11.0 points each). SA typifies psychological violence (7.9 points), sexual violence (7.5 points) and other forms of violence (7.3 points). NAs typifies psychological (4.4 points), sexual and physical (4.3 points each) violence. As for the data by types of violence, significant differences in SA ($p=0.039$), NAs ($p=0.026$) and BR ($p=0.004$) and total score in the CSHQ ($p=0.004$) have been found.

Discussion

Childhood sleep presents some degree of prevalence of disorders without exposure to situations of violence. The fact that SDs in children not exposed to violence, according to a Portuguese study that applied the CSHQ questionnaire, occurs in a prevalence of 24.3%

with an average age of 6.50 ± 2.49 points in a CSHQ score must be taken into account (18).

Comparing the child population that have experienced child violence events, SDs are shown in 66.7% of children with an average age of 6.2 ± 2.4 years old (in a CSHQ score), as observed in the present study. SDs are more prevalent in girls, whether in children exposed to violence or not (18).

In general, SDs are reported in the literature with a prevalence of 16 to 40% among children who have experienced child violence (7, 18). According to a study carried out in Japan that evaluated 273 institutionalized children who were victims of violence, an age group between 4 and 15 years old was observed, with an average age of 9.9 ± 3.2 , almost equal sex ratio between genders and prevalence of SDs of 40%. Regarding the type of violence, it was observed that approximately half of the children

had suffered neglect (45.4%), psychological abuse (53.1%) and physical abuse (50.5%), while 7.7% of the children had suffered sexual abuse (4). By comparing this information to the current study, the profile of the sample that has been evaluated shows a predominance of females (59.3%) and an age range with the highest rate of sleep disturbance between 4 and 7 years old (48.8%). Among the types of violence, physical violence has been found in 40.7% of the children, followed by sexual violence (35.8%), psychological violence (24.4%), neglect (14.6%) and other types (4.1%).

When analyzing the presence of SDs associated with each type of violence alone, a higher prevalence in relation to sexual violence (78.9%), psychological violence (85.7%) and other forms of violence (75%) — the witnessing of domestic violence — has been found. The OTV have been less prevalent.

By comparing the subcategories that characterize SDs through the CSHQ, it has been observed that, in children that have not suffered violence, there is an SD pattern with a predominance of parasomnias (confusional arousals, sleepwalking, night terrors, nightmares, sleep paralysis and nocturnal enuresis), bed resistance and SA (16,18). Concerning children in the context of violence, the presence of daytime sleepiness, parasomnias and BR have been associated with the highest scores.

In relation to the high prevalence of SDs related to sexual violence among the children who have been evaluated, a sleep pattern with a significant predominance of BR has been observed. It has been assumed that violence is an uncontrollable and frightening experience that affects the regulation of affective and cognitive functions of the central nervous system, generating a state of increased excitement associated with SDs (19). When the children experience violation of their own body, they express the event somatically, since new sensations have been awakened and have not had the possibility of being integrated (20).

Sexually abused preschoolers have presented more dissociative symptoms than non-abused children, which is commonly understood as a protective response to traumatic events. An

unstable cycle of sleep and wakefulness has been related to dissociative symptoms because it correlates with an unusual sleep pattern (for example, rapid eye movement fragmentation, sleep paralysis, nightmares, recurring dreams, waking dreams) (21).

Sexual abuse exposes the child to a situation of total helplessness. The adult who should be perceived as a source of protection becomes a source of disturbance and threat. The child feels unable to convey information about the violence and can even be inclined, due to the complexity of the relationship, to feel guilty (22). Prospectively, adults who experienced sexual violence during childhood may have a reflex of psychophysiological hyperstimulation due to hyperactivity of the hypothalamic-pituitary-adrenal axis that regulates the sleep-wake cycle (19).

Psychological violence, presented as the most prevalent type of violence associated with sleep disturbance in this study, shows sleep-disordered breathing and changes in SOD as significant characteristics. Concerning SDB, symptoms such as central sleep apnea, hypoventilation disorders and hypoxemia have been observed. Such changes result in daytime consequences such as hyperactivity, behavioral problems or learning difficulties (18).

Regarding psychological violence, a "caregiver pattern" has been observed, which conveys to the children the feelings of worthlessness and failure in relation to their actions. Guardians can make children feel that they are unloved, unwanted, or valuable only when meeting a parent's need. Emotional mistreatment can involve acts of omission (ignoring the need for interactions) or commission (rejecting, frightening). Children are negatively affected in cognitive, social, emotional and physical aspects of development (20).

This study has had interference in the evaluation of the SDs: the existence of the habit of sharing a bed, which has not been qualified among the data. Considering that this habit is performed by other members of the family and sometimes shared with the aggressor, there is a significant change in the sleep disturbance parameters assessed.

Regarding the application of the CSHQ, the collection of information has had some limitations regarding the reliability of answers. Some of the informants who accompanied the children and provided the information were either not closely related to them or had been living with them for a short period or had not been living in the same house, not being aware of the current characteristics of their sleep pattern. Most of the reports were brought by the child's family or legal guardians. By the rules of the institution that provided childcare, the family member who accompanied the child could not be the possible aggressor.

Initially, the classification of children seen at the reference center as "victims of violence" was based on the suspicion of violence by complaint, which was followed by a clinical evaluation. Next, the information was verified through more sources of reports and legal confirmations. The reference center unit in Canoas did not have a combined expert assessment service with the Medical-Legal Department at the time.

Based on the data from this study, it is possible to conclude that there is a significant occurrence of SDs associated with situations of child violence. Certain types of violence have been found to have a greater negative impact on children's sleep habits. The type of violence can also be related to specific SDs. These results can help the professionals who are providing medical care to the children to pay attention to complaints of SDs, especially when it appears as an isolated complaint, and thus they can develop targeted approach strategies.

Notes

Part of this study was presented at the Brazilian Sleep Congress Pediatrics (October, 09th, 2019) and at the Brazilian Sleep Congress (December, 20th, 2019).

Funding

This study was financially supported by the corresponding author.

Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; to have drafted the work or revising it critically for important intellectual content; to have approved the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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Os textos deste artigo foram conferidos pela Poá Comunicação e antes da publicação.