

Self-report of pain intensity: correlation between children, parents, and nurses

Autoavaliação da intensidade da dor: correlação entre crianças, pais e enfermeiros

Autoevaluación de la intensidad del dolor: correlación entre niños, padres y enfermero

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Abstract

Background: In pediatrics, pain self-report is often impossible and the uncertainty regarding the degree of agreement between parents and nurses' proxy-report and children's self-report is a concern.

Objective: To assess the degree of agreement between children, parents, and nurses' reports of pain intensity.

Methodology: A descriptive, cross-sectional study was conducted in two health units involving 64 children (aged 5-17 years), their parents, and nurses. The Visual Analogue Scale and the Face, Legs, Activity, Cry, Consolability (FLACC) scale were used to assess pain intensity.

Results: When parents and nurses used the FLACC scale to assess pain, a moderate correlation was found between children and nurses' reports ($r_s = 0.51$; $p < 0.01$) and between children and parents' reports ($r_s = 0.55$; $p < 0.01$).

Conclusion: Children's self-report of pain intensity is moderately correlated with parents and nurses' proxy-reports.

Keywords: nursing; pain; assessment; child

Resumo

Enquadramento: Em pediatria são frequentes as situações clínicas em que existe impossibilidade de autoavaliação da dor e incerteza quanto à correlação existente entre a avaliação feita por pais e enfermeiros e o autorrelato da criança.

Objetivo: Avaliar o grau de correlação da avaliação da intensidade da dor entre crianças, pais e enfermeiros.

Metodologia: Estudo descritivo correlacional, transversal, realizado em duas unidades de saúde com a participação de 64 crianças (5 - 17 anos), seus pais e enfermeiros cuidadores. Na avaliação da intensidade da dor foram utilizadas a Escala Visual Analógica e a escala *Face, Legs, Activity, Cry, Consolability* (FLACC).

Resultados: Quando pais e enfermeiros avaliaram a dor com a escala FLACC, a correlação com o autorrelato revelou-se moderada entre crianças e pais ($r_s = 0,51$; $p < 0,01$) e entre crianças e enfermeiros ($r_s = 0,55$; $p < 0,01$).

Conclusão: A autoavaliação da intensidade da dor das crianças apresenta moderadas correlações com a avaliação feita por pais e enfermeiros.

Palavras-chave: enfermagem; dor; avaliação; criança

Resumen

Marco contextual: En pediatría son frecuentes las situaciones clínicas en las que existe cierta imposibilidad de autoevaluación del dolor, así como incertidumbre en cuanto a la correlación existente entre la evaluación hecha por padres y enfermeros y el autorrelato del niño.

Objetivo: Evaluar el grado de correlación de la evaluación de la intensidad del dolor entre niños, padres y enfermeros.

Metodología: Estudio descriptivo correlacional, transversal, desarrollado en dos unidades de salud con la participación de 64 niños (de 5 a 17 años), sus padres y enfermeros cuidadores. En la evaluación de la intensidad del dolor se utilizaron la Escala Visual Analógica y la Escala *Face, Legs, Activity, Cry, Consolability* (FLACC).

Resultados: Cuando los padres y los enfermeros evaluaron el dolor con la escala FLACC, la correlación con el autorrelato se mostró moderada entre niños y padres ($r_s = 0,51$; $p < 0,01$) y entre niños y enfermeros ($r_s = 0,55$; $p < 0,01$).

Conclusión: La autoevaluación de la intensidad del dolor de los niños presenta moderadas correlaciones con la evaluación hecha por padres y enfermeros.

Palabras clave: enfermería; dolor; evaluación; niño

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Introduction

Every human being is exposed to pain early in life. Pain is defined as a universal, personal, and subjective experience, involving multiple dimensions (physiological, sensory, cognitive, affective, socio-cultural, and behavioral), being part of a response to a pathological situation or being itself a health problem (Batalha, 2010). The negligence in pain assessment and management has been recognized as a problem that must be carefully addressed to achieve quality care.

Pediatric pain involves a higher degree of complexity. Self-report is the gold standard in the assessment of pediatric pain intensity. However, nurses and parents should only assess pain in preverbal children or children who are unable to self-report due to their clinical condition using standardized scales (proxy-report). These situations are common in pediatrics; thus, it is important to identify to what extent are the parents/accompanying person and nurses' reports correlated with the child's self-report. The decision for an effective pain management should be consistent with children's pain perception.

The few studies on the degree of agreement between children's self-report and parents and nurses' reports of pain intensity obtained different results, but a consistent trend was observed in which the child's self-reported pain was usually higher than the pain reported by parents and nurses (Brudvik, Moutte, Baste, & Morken, 2017; Kamper, Dissing, & Hestbaek, 2016; Lifland, Mangione-Smith, Palermo, & Rabbits, 2017; Zhou, Roberts, & Horgan, 2008).

It is important to clarify the association between children's self-report of pain intensity and their parents and nurses' proxy-reports to make valid decisions in clinical practice regarding the diagnosis of the situation and the implementation of effective pain management strategies. Thus, this study aims to assess the degree of agreement between children, parents, and nurses' reports of pain intensity.

Background

According to the International Association for the Study of Pain, pain is an unpleasant

sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. This definition is widely accepted, but not exempt from criticism. Although preverbal children or children who are unable to self-report due to their clinical condition cannot describe pain, they still experience it. The non-recognition of this evidence has been a major obstacle to controlling pain.

Pain perception is an inherent quality of life, a primary and intrinsic sensation like any other organic feeling, be it olfactory, tactile, visual, auditory or gustatory, which is present in all beings with a central nervous system and early development (Batalha, 2015). The myth that children do not feel pain, feel less pain than adults or forget pain quickly (do not memorize it) are false beliefs. On the contrary, the child is hyperalgesic when compared to adults (Goksan et al., 2015) and children who are unable to self-report are more vulnerable and dependent on the validity and reliability of their caregivers' pain intensity assessment (Batalha, 2010).

In the health team, the nurse plays a key role in the evaluation and control of pain, ensuring a regular, objective, valid, and reliable assessment of pain, which is particularly complex among children who are unable to self-report. These children use physiological and behavioral indicators to communicate and describe pain. Decoding this language is only possible using standardized scales that include these indicators. Its use requires competence because the interpretation of pain manifestations should be exempt from value judgments, which is not always an easy task given the multiplicity of biological, cognitive, psychological, socio-cultural, and situational factors influencing its perception, manifestation, and meaning (Batalha, 2010; Brudvik et al., 2017).

In its guidelines for the assessment of pain intensity in children, the Portuguese Directorate-General for Health (*Direção-Geral da Saúde*, DGS) recommends a regular and systematic assessment since the first contact with the child through the use of scales appropriate to the child's age/cognitive development, type of pain, and clinical condition (DGS, 2010). Whenever possible, self-report should be the

method used to assess pain intensity (after the age of 4); however, when that is not possible, pain should be assessed by health professionals (usually nurses), parents or others. Although self-report is the best way to obtain a valid and reliable assessment, it is important to know whose assessment is more consistent with the child's assessment, when self-report is not possible. This is an old concern (Colwell, Clark, & Perkins, 1996; Favaloro & Touzel, 1990; Manne, Jacobsen, & Redd, 1992); however, only a few studies on pain addressed the correlation between children, parents, and nurses' reports of pain intensity and with different results (Brudvik et al., 2017; Voepel-Lewis, Malviya, & Tait, 2005).

In a search conducted in the MEDLINE and Journal of Nursing Referência databases, using the keywords *enfermagem* (nursing), *dor* (pain), *avaliação* (assessment), and *criança* (child), connected by the Boolean operator "AND", in all search fields, a meta-analysis of 12 studies and four studies published between 2009 and 2017 were found that compared pain intensity assessment by children, parents, and nurses.

The meta-analysis conducted by Zhou et al. (2008) aimed to investigate the association between self-report pain ratings for the dyads of child and parent, child and nurse, and parent and nurse. Of the 12 studies analyzed, which included children aged between 1 and 18 years, nine correlations between children and parents, eight between children and nurses, and five between parents and nurses were identified. Using Pearson's correlation coefficient, these studies found moderate correlations between the dyad of child and parent ($r = 0.64$) and the dyad of child and nurse ($r = 0.58$) and a weak correlation for the dyad parent and nurse ($r = 0.49$). The studies revealed heterogeneous results, with the correlations in the dyad of parent and child ranging from 0.32 to 0.76, from 0.08 to 0.85 in the dyad child and nurse, and from 0.04 to 0.75 in the dyad of parent and nurse. The authors concluded that parents and nurses' perceptions of their children's pain should only be considered as estimates of the pain experienced by the children, and not the same as children's self-reports.

The other four studies used different meth-

odologies, but all of them indicated that pain intensity experienced by the children is higher than that reported by parents and nurses (Brudvik et al., 2017; Lifland et al., 2017; Kamper et al., 2016; Khin Hla et al., 2014; Rajasagaram, Taylor, Braitberg, Pearsell, & Capp, 2009).

To sum up, despite the scarcity of studies, a heterogeneity was found in the correlations between children, parents, and nurses' reports of pain intensity. However, there is a tendency for parents and nurses to underestimate pain intensity, when compared to children's self-reports.

Research question

What is the degree of agreement between children, parents, and nurses' reports of pain intensity?

Methodology

A between-subjects cross-sectional and correlational study (Polit & Beck, 2016) was conducted at the inpatient unit of the two institutions and the outpatient unit of the Hospital Center of São Francisco, involving children aged between 5 and 17 years, their parents, and the nurses responsible for their care. The sample was consecutively selected and data were collected between 23 May and 23 November 2015. Children hospitalized for surgery, pediatric, ophthalmology, and surgery consultations, and admission to the outpatient unit for procedures or treatments were included in the study. Children who were unable to self-report pain and parents who were unable to assess pain intensity, even with prior training, were excluded from the study. The instruments used to assess pain intensity were the Portuguese versions of the Visual Analogue Scale (VAS; Batalha, 2010) and the Face, Legs, Activity, Cry and Consolability scale (FLACC; Batalha, Reis, Costa, Carvalho, & Miguens, 2009). Both scales measure pain from 0 points (*no pain*) to 10 points (*maximum pain*) and are recommended by DGS (DGS, 2010). Pain intensity was classified as follows: *no pain* (0 points); *mild*

pain (1-3); *moderate pain* (4-6); and *severe pain* (7-10; Batalha & Mendes, 2013).

A form was designed to record data on demographic and clinical characteristics and assess pain intensity.

Pain intensity was assessed independently by respecting the following order: child, parents, and nurse. The VAS scale was used to assess pain intensity reported by children, parents, and nurses. The FLACC scale was used to assess parents and nurses' reports of the child's pain intensity. Data were analyzed using the statistical software IBM SPSS Statistics, version 19.0. Kolmogorov-Smirnov test and histogram were used to test for a normal distribution and showed that none of the variables met the assumption of normality. Absolute and relative frequencies were used for categorical variables and the median and the minimum and maximum limits were used for continuous variables. Spearman's correlation coefficient was used to assess the correlation between children, parents, and nurses' reports of pain intensity. In this study, r_s values < 0.20 indicate a *very low* correlation, 0.20-0.39 indicated a *low* correlation, 0.40-0.69 indicated a *moderate* correlation, 0.70-0.89 indicated a *high* correlation, and 0.9-1 indicated a *very high* correlation (Pestana & Gageiro, 2008).

The study met the standards proposed by the National Council of Ethics for the Life Sciences in Portugal and was approved by the Ethics Committee of the Health Sciences Research Unit: Nursing (UICISA: E) of the Nursing School of Coimbra (ESENfC; Opinion P243-11/2014). Permission to conduct the study was requested from the board of directors of the Casa de Saúde de Santa Filomena and the Hospital Center of São Francisco.

Results

The study sample was composed of 64 dyads of children, parents, and nurses. Children's mean age was 9.2 ± 4 years, and 34 (53.1%) participants were girls. Parents' mean age was 40 ± 5.3 years and most of them were wom-

en (48; 75%). The majority of parents had a bachelor's degree (33; 51.6%), followed by the 12th grade (18; 28.1%). Nurses' mean age was 29.7 ± 8.7 years and 50 (78.1%) of them were female nurses.

The most common reasons for children's hospitalization was surgery (31; 48.4%) and the need for admission to a specialty consultation or to receive care in a permanent care unit of the outpatient unit (33; 51.6%).

Pain intensity was assessed by 32 (50.0%) children in the inpatient unit and other 32 children in the outpatient unit. At the time of pain intensity assessment, 45 (70.3%) children were not taking any analgesic medication and 37 (57.8%) children reported not being afraid.

Pain intensity assessment using the VAS showed a median of 3.0 (0-9) points in children, a median of 2.0 (0-10) points in parents, and a median of 1.0 (0-9) points in nurses. The results were similar when parents and nurses rated pain using the FLACC scale: 2.0 (0-9) points and 1.0 (0-9) point, respectively.

Table 1 shows that the children, parents, and nurses' reports of pain intensity assessment using the VAS are moderately correlated (r_s values ranging from 0.48 to 0.66). The highest correlation was found between children and parents ($r_s = 0.66$; $p < 0.01$) and the lowest between children and nurses ($r_s = 0.48$; $p < 0.01$).

When parents and nurses rated pain using the FLACC scale, a moderate correlation was found with children's self-reports in both dyads: between children and parents ($r_s = 0.51$; $p < 0.01$) and between children and nurses ($r_s = 0.55$; $p < 0.01$).

Regardless of the scale used (VAS or FLACC), the correlations between parents and nurses were moderate (r_s values ranging from 0.42 to 0.68). The highest correlation was found between parents when assessing pain using the FLACC scale and the VAS ($r_s = 0.68$; $p < 0.01$) and the lowest correlation between nurses' assessment using the VAS and parents' assessment using the FLACC scale ($r_s = 0.42$; $p < 0.01$).

Table 1

Correlation of pain intensity assessment between children, parents, and nurses

Scales	VAS			FLACC
	Children	Parents/ Accompanying Person	Nurses	Parents/ Accompanying Person
VAS, r_s				
Parents/ Accompanying Person	0.66*			
Nurses	0.48*	0.56*	-	
FLACC, r_s				
Parents/ Accompanying Person	0.51*	0.68*	0.42*	
Nurses	0.55*	0.52*	0.61*	0.66*

Note. *Spearman's correlation: $p < 0.01$.

Discussion

According to DGS guidelines (DGS, 2010), pain intensity should be self-reported by children aged 6 years or older using the VAS. Whenever the child is unable to self-report, either due to their cognitive development or clinical condition, the assessment should be done by others (parents or nurses) using the FLACC scale as the first option.

The objective of this study was to assess the degree of agreement between children, parents, and nurses' reports of pain intensity. According to the criteria by Pestana and Gageiro (2008), the moderate correlations found in this study follow the same tendency as other studies (Brudvik et al., 2017; Rajasagaram et al., 2009; Kamper et al., 2016; Khin Hla et al., 2014) in two aspects: the tendency for nurses and parents to underestimate pain and the tendency for parents' reports of their children's pain to be more similar to their children's self-reports of pain.

Regardless of the scales used by parents and nurses (VAS and the FLACC scale), their reports were always lower than those reported by children. The underassessment of children's pain by their parents/accompanying person and nurses deserves special attention. Children are more vulnerable to the painful experience, but become even more vulnerable when they find themselves in a situation

when they are unable to verbally communicate their pain. In these situations, the proxy-report of pain intensity is the last resource to assess pain, both in children and in adults. When using proxy scales, one must value and interpret the behaviors and follow the specific methodological steps for each scale. In case of doubt, the principle to follow in pain assessment should be to choose the highest value in order to correct the tendency shown in studies for an underestimation of the pain felt by others. The assumption that should be followed in pain management is that it is preferable to treat pain in a child who does not feel pain than not to treat pain in a child in pain (Batalha, 2010). Parents' reports were closer to the children's self-reports than nurses when all of them used the same scale, the VAS. VAS is a self-administered scale and its use by others other than the self, in this case, the child, is questionable (Batalha, 2010). However, the results found in this study leave this possibility open because studies show that when children, parents, and nurses use the same assessment tool, the correlations are higher than when they use different scales (Zhou et al., 2008).

Two reasons might explain this phenomenon. On the one hand, parents are usually those who best know their child and, on the other hand, the VAS is unidimensional and easier to apply than behavioral scales, such as the FLACC scale.

According to DGS guidelines (DGS, 2010), the FLACC scale must be used when children are unable to self-report their pain intensity. Using this scale, nurses showed a better correlation, albeit very slightly, with children's self-report than parents.

Nurses have specific skills in the area of pain assessment, so they are expected to have better correlations with children's self-reports than parents/accompanying person. However, we believe that, if properly instructed, parents can become important members of the healthcare team whenever their children are unable to self-report their level of pain intensity. Their profound knowledge of their child allows them to decode the pain manifestations in a valid and reliable way. The fact that parents have obtained the highest correlation, from among all the dyads analyzed strengthens our conviction that they should be involved in the assessment of their children's pain, as long as they receive proper training. When both used the VAS, the lowest correlation was found between children and nurses. This result reinforces the guidelines issued by DGS (2010) that recommend the use of behavioral/composed scales for the proxy-report of children's pain intensity.

In short, the results of the correlations between the children and parents dyads and between the children and nurses dyads are similar to those found in the meta-analysis conducted by Zhou et al. (2008). Similarly to the authors, we share the view that parents and nurses' reports are estimates of pain experiences and that they do not reflect the actual pain experienced by the children. However, it is important to underline, once again, that, when the child is unable to self-report, nurses and parents/accompanying person should not underestimate children's signs of pain and that parents should always be included in the assessment of their children's pain.

The results should be interpreted in light of some identified limitations: the small sample size, the little diversity of the common clinical situations in pediatric age, and the fact that nearly half of the children reported being afraid before pain was assessed. This variable was not controlled for in this study and we do not know whether it was assessed in others, but it can interfere with the results of pain

self-report, for which reason we recommend that it be controlled for in future studies.

This study contributes to clarifying the actual intensity of pain felt by those who experience it by suggesting that children's self-reports of pain intensity are moderately correlated with parents and nurses' assessment.

Conclusion

The moderate correlations in the assessment of pain intensity between children, parents, and nurses reveal that nurses and parents' perceptions are valid and should be taken into account in clinical practice. However, it is important to emphasize that they are only estimates of the pain actually experienced by children.

Regardless of the pain scales, nurses and parents underestimated the intensity of the child's pain when compared to the child's self-report. Parents are the members of the healthcare team who best know the child, so they need to be involved in the assessment of pain intensity because the moderate correlations observed in this study can be improved with parents' training on how to assess their children's pain.

Future studies are needed with larger samples that better represent the diversity of the most common clinical situations in pediatric age, using pain intensity assessment scales that take into account the type of pain, the clinical context, and the child's age/cognitive development.

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