Reviewer's report

**Title:** Children suffering from severe chronic pain: A 5-year retrospective study on 2249 pediatric pain patients

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**Reviewer:** Karen Kaczynski

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BMC Pediatrics

Children suffering from severe chronic pain: A 5-year retrospective study on 2249 pediatric pain patients

This is a descriptive and correlational study of a large number of children and adolescents treated at a tertiary care facility specializing in the treatment of chronic pain. The study aims to describe key characteristics of these youth as well as to identify factors associated with higher impairment in this population. The goal of this research is to inform how the health care system treats these children and teens. This article has many strengths including large sample size and use of standardized self-report measures. However, there are significant issues that need to be addressed before this paper can be considered for publication. Comments follow.

Major compulsory revisions:

1. The most significant issue is the lack of importance of this study. Substantial research exists, including epidemiological studies (e.g., King, Chambers, Huget, et al., Pain, 2011), describing the characteristics and psychosocial correlates of chronic pain in youth, and it is unclear how this paper adds to existing literature. Although the sample size is large, the conclusions drawn are consistent with prior studies, and large sample size is not enough to justify publication. In order to be considered for publication, the authors must make a stronger argument that this paper is important and fills gaps in prior literature.

2. In general, the conclusion section in the Abstract makes some strong points about why the current study is important (e.g. because chronic pain is associated with poor developmental and functional outcomes). It could better frame the article if the authors made some of these points in the Background section as well, supported with appropriate references.

3. Several variables are included in the study as possible correlates or predictors of impairment. However, these variables are not discussed in the Background. There is a large literature on factors that are associated with impairment related to chronic pain, and this should be included in the introduction. Specifically, the authors should justify why they chose these particular predictors (i.e., age, gender, school impairment) and reference prior research to support their decisions.
4. Measures should be described in more detail. For each measure, please include a brief description of sample items, response options, scoring procedures, and cut-off scores, if appropriate. Also provide reliability and validity information and internal consistency statistics for the current population.

5. Completing missing items on child questionnaires with parent proxy report is not acceptable. Research has shown that child- and parent-report are inconsistent, particularly regarding internalizing and somatic symptoms (e.g., Kröner-Herwig, Morris, Heinrich, et al., Clin J Pain, 2009). Given the large N, a proportion of missing data should not be too problematic.

6. Please explain how the criteria were selected for assignment into the high impairment group. Were these cutoffs used in any other studies, or is there evidence that they are meaningful in predicting outcomes (e.g. future impairment without treatment)?

7. While dichotomizing variables can facilitate clinical interpretation, it can also result in a loss of information. Where dichotomies were created, it would be helpful to know on what basis this was done (mean split, clinical significance?) and a justification for this decision.

8. Several variables reported in the results have not been described in the Background or Measures (e.g., fear of exam, school aversion). These variables should be described and the method of assessing them more clearly defined.

9. How were the age cutoffs selected? Because there are so many groups used and comparisons made, interpretation of some results becomes unclear. For example, how is the reader to interpret the finding that distribution of pain location did not differ between genders except in 11 to 14-year-olds? A developmental justification is needed to support the decision to separate the sample into so many distinct age groups rather than looking at age as a continuous variable.

10. This paper has 6 tables and 4 figures, which seems excessive. The authors should attempt to consolidate the tables or report some of the data in summary format in the text.

11. Paragraph 4 reports the preponderance of girls in the sample and describes adolescent girls as “a very vulnerable group.” The next paragraph reports that sex differences are minimal and that age differences are most meaningful. These two conclusions seem contradictory and efforts should be made to integrate these findings.

12. Would another possible reason that adolescents seen at this tertiary care facility have had longer illness durations and previous treatment failures be that the healthcare system is actually functioning well, in attempting to address these issues in primary and secondary care settings before sending a smaller portion who fail at these levels to tertiary care? Some more clarification of the reasoning behind the strong conclusions of the last paragraph appears warranted. Additionally, alternative explanations should be included.

Minor essential revisions:
13. It would be helpful for authors to clarify the meaning of “severely impaired” in the abstract. Is this in terms of the patients’ functioning?

14. Please clarify the prevalence rates in the first paragraph of the Background. Is this lifetime prevalence? Of what severity of chronic pain/what level of functional impairment?

15. In the second paragraph of the Background, are these statements about existing research in adults or in youth?

16. The treatment model in the clinic as described in the Methods implies that organic causes for the pain have been ruled out (e.g., they “prevent further unnecessary diagnostic or medical intervention). This needs to be explicitly stated.

17. The Total row of Table 1 should be more prominent, as general demographic data are of interest, not just demographic data broken down by pain location.

18. Figure 1 needs a label on the Y axis.

19. It seems as though Figure 2 could be improved by presenting the data in another format. As it is, the figure emphasizes the association between age at first appointment and age of pain onset, which is not a surprising finding. What is an interesting finding is the relationship between years since pain onset and age at first appointment. Could the figure be altered to emphasize that finding?

20. Figure 3 seems to be presenting a lot of information at once, and could be improved by labeling bars for depression and anxiety in the footnote to the table and/or choosing between presenting means or percentages above cutoff rather than including both.

21. In the first paragraph of the Discussion, the authors describe impairment in “normal leisure time activities.” How was this assessed? A measure of leisure activities was not described in the methods.

22. The first sentence in the third paragraph of the discussion is a run-on sentence and the point of this sentence is not clear.

23. The authors draw conclusions regarding the prevalence of comorbid psychiatric conditions based on elevated scores on anxiety and depression questionnaires. It is not possible to make a diagnosis based on a questionnaire. Rather than discussing comorbid diagnoses, the authors should discuss the prevalence of elevated symptoms of anxiety and depression.

24. The authors cite data on the lack of appropriate treatment facilities for youth with chronic pain in the conclusions. Given that this was one of the goals of this paper, this information should be presented earlier, in the Background.

**Level of interest:** An article of insufficient interest to warrant publication in a scientific/medical journal

**Quality of written English:** Needs some language corrections before being published
**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I declare that I have no competing interests