Article ID: CMAJOpen-2021-0337

Title: Readiness of emergency departments for pediatric patients: a systematic review

Authors: Jessica A Harper MD, Amanda Coyle MPH, Clara Tam MESc, Megan Skakum BSc, Mirna Ragheb BN, Lucy Wilson MScPH, Mê-Linh Lê MA MLIS AHIP, Terry P Klassen MD MSc, Alex Aregbesola MD PhD

Reviewer 1: Andrew Dixon

Affiliation: University of Alberta, Pediatrics

Overall, this is a well written and appropriately conducted meta-analysis. The search strategies and statistical analysis is appropriate.

Thank you for the comment

1. My only real concern is with the conclusion. The analysis of the data did not reach statistical significance for the primary outcome. WPRS associated with mortality (pooled OR 0.52 CI 0.2-1.06) is not statistically significant. Therefore, the statement that "Children presenting to emergency departments with higher pediatric readiness scores have a lower risk of mortality and better health outcomes" is not supported. I think the mortality statement needs a qualifier, trends towards or some other such statement. As there was no meta-analysis performed on health outcomes, I don't think a statement regarding health outcomes is relevant to the conclusions of the study-and should be removed.

We have addressed the concerns regarding the results of the morality. Please see above. The statement about health outcomes has been removed from the conclusion.

(Interpretation; Conclusion)

> *Children presenting to emergency departments with higher pediatric readiness scores have a lower risk of mortality.*

Other considerations

2. P7 L48-Not clear what "and being more prepared for the care of..." means. Was there some other measure of preparedness looked at? This seems to indicate some measure other than the WPRS.

This statement has been clarified.

(Interpretation)

> *As higher WPRS and readiness to care for critically ill and injured children directly impacts risk of mortality, emphasis should be placed on preparing all EDs for children.*

3. p8 L10. Should there be some comment about how well this applies to the Canadian context, where far fewer children are located so close to an emergency department, especially one with a WPRS of 100.

See response to comment 28 from decision editor above.

Reviewer 2: Roger Chafe
Affiliation: Memorial University, Pediatrics

Most Canadian pediatric patients seen in an emergency department (ED) are not seen in an ED associated with a pediatric hospital. Rather they are seen in general EDs. These EDs may be located some distance from a pediatric hospital. This situation raises potential quality of care issues for these patients, including the lack of pediatric expert care, lack of appropriate access to pain management, and the need to be transferred long distances to other facilities to receive age-appropriate care. It is good to see that the authors are raising this important issue. There is the reasonable presupposition also that if non-pediatric EDs were more ready for pediatric patients, this would improve patient outcomes. It would be good, as mentioned by the authors, for all hospitals to improve "access to pediatric specific resuscitation equipment, medication dosing, interfacility transfer guidelines, ED policies, and care coordinators." The key question for this review is what do the findings of this article contribute to this topic.

The weighted pediatric readiness score (WPRS) is a composite measure of ED readiness to treat pediatric patients based on a 55-question assessment. It uses a wide range of pediatric-related quality of care metrics to develop a score from 1 – 100. The study examined whether pediatric readiness, as measured by the WPRS, is associated with lower mortality and, as secondary outcomes, better health outcomes and improved healthcare utilization.

The WPRS and its components should be described in greater detail in the article, including discussion of the factors that most influence an ED's WPRS. For example, Remick (2016) found that "the presence of at least 1 pediatric emergency care coordinator was associated with a higher WPRS (85; IQR 75, 93.1) versus EDs without a coordinator (58; IQR 50.1, 66.9), and the presence of a quality improvement plan was associated with a higher WPRS (88; IQR 76.7, 95) compared with that of hospitals without a plan (62; IQR 51.2, 68.7)." The potential connection between ED readiness and its impact on quality outcomes, like mortality, is complicated. Understanding the full scope of what the WPRS is measuring is important in understanding the implication of its potential association with mortality.

The authors used a systematic review method. This review is done well and has several features that the authors should be commended on, including having the review protocol registered and having the search strategy peered review by another librarian.

Thank you for your comments.

1. The authors say that they were motivated in their primary outcome by Ames (2019). Although the review appears to be well conducted, only two additional studies that focused on the association between WPRS and mortality were identified. While all three studies point to an association between higher WPRSs and lower mortality, the authors'

conclusion that "children presenting to EDs with higher WPRS have a lower risk of mortality" could be perhaps more measured. In fact, the relatively small evidence based for the WPRS's connection to mortality should be discussed more. Why so few studies? Is it that the measure is not widely used?

The WPRS is a relatively new scale that originated in the United States. The scale has been used to identify gaps in pediatric readiness of health care centres across the world, and more recently is starting to be used to look at outcomes.

2. In terms of the studies used in the meta-analysis, differences in the specific populations studied and in their outcome measures should be discussed. So too, what are the implications of these differences for doing a meta-analysis? How were the differences in outcome measures and patient populations accounted for in the analysis? There should also be more discussion of the potential weaknesses of the studies.

We have addressed the concerns regarding different outcome measures above. See response to decision editor comment 1 and 7. The limitations section of the discussion has also been expanded.

3. Given that there are only 6 studies discussed in total, tables 1-3 are a little confusing. The summary of the studies should be done in one table, with perhaps more discussion of the studies and what the authors see as their main implications in the text.

Thank you for this feedback. We felt that splitting up the tables made it easier for readers to follow as it avoided having one large table with a significant amount of information.

While I think the study was well conducted and the issue of the quality of care for pediatric patients seen in a non-pediatric emergency department is an important one, the biggest question I struggled with is the significance of the findings to the topic area, particularly given the small number of studies ultimately included in the review and with the analysis of the findings.

Thank you for your comment. We agree this is a very important topic, and also agree that unfortunately there were not a large number of studies to be included. We do think that it is an important start to encouraging hospitals to focus on readiness for pediatric patients, and can lead to further research in the area.