Reviewer's report

Title: Application of biomedical informatics to chronic pediatric diseases: A systematic review

Version: 1 Date: 11 February 2009

Reviewer: Edmund Chaney

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Major Compulsory Revisions
1. Reviewing the application of biomedical informatics to chronic pediatric diseases is timely, if as the authors indicate, there are no other recent comprehensive reviews. The article abstraction methods the authors used appear appropriate. The authors found a very heterogeneous collection of studies meeting their criteria, differing particularly in chronic condition, intervention domain and intervention method. Since the body of studies is not coherent enough yet to be amenable to standard meta-analytic methods, the authors’ primary challenge is to organize their review so that it is more than a narrative. This task would be assisted by a more critical approach, beginning with an explicit theoretical perspective. There have been various attempts to classify biomedical informatics interventions and the authors should more explicitly comment on how these are or are not relevant to the body of literature that they are reviewing. This would help define the question that the review proposes to answer.

2. The authors indicate that most of the reviewed studies report positive outcomes. Since chronic conditions are difficult to treat and this is a relatively new literature area in which success presumably comes in fits and starts, to what extent does the preponderance of positive outcomes reflect reality, author emphasis or positive result publication bias? Are the methods of the reviewed studies all of sufficient quality to support an overall conclusion of positive outcome? The authors report they evaluated methodological adequacy of the studies but do not report their results. A more critical methodological perspective would be helpful here. This should be reflected in the limitations section.

3. The authors organize their presentation with regard to chronic illness condition, so that within each illness reviewed studies’ intervention targets and methods vary. This approach should be justified as superior to an organization by intervention targets or intervention method. Which approach provides the most useful framework to learn from what has been done so far?

4. The ability to generalize from the authors’ review depends on classification of subject samples, intervention types and targets. The review’s illness categories are asthma, cognitive impairment, autism, oncology, diabetes, other and the Discussion adds an obesity study. The cognitive impairment and autism categories overlap in that, for example, both include children with ADHD. Given
the small number of studies involved and the overlap, what is the expository benefit of having more than three chronic condition categories; asthma, cognitive impairment, and other? The domain classification does not always make it clear whether the intervention targets were the patients, caregivers, medical providers, or treatment system. Little detail is given about the informatics interventions themselves. Are all unique? Have some had more development than others? How do they relate to informatics interventions in the adult literature?

5. Finally, reviews of medical informatics literature pertaining to treatment of adults with chronic conditions suggest that at least as important as the informatics intervention itself are the human factors that are involved. How is the intervention introduced? How are involved individuals trained in its use? How does it relate to other treatment factors? It would be interesting to know whether the authors’ review revealed the importance of similar contextual factors in this as yet nascent pediatric informatics literature.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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.