Reviewer's report

Title: A mobile health monitoring-and-treatment system based on integration of the SSN sensor ontology and the HL7 FHIR standard

Version: 0 Date: 26 Feb 2019

Reviewer: Siyu Qian

Reviewer's report:

This study presents a mobile health framework with decision support capability for monitoring and managing type 1 diabetes mellitus. The authors developed a comprehensive ontology which contains 9577 classes, 658 object properties, 164 data properties and 140 SWRL rules. This ontology also incorporate the HL7 FHIR standard, semantic sensor network ontology, basic formal ontology and clinical guidelines to enable interoperability with EHR systems and sensor network and the ability to be integrated with existing EHR systems. The authors described in detail the development and evaluation process and outcome. I have some minor comments that need to be addressed.

Introduction

1. Page 2 line 50, reference is needed to support the statement 'Patients with T1D do not produce any insulin, and must exogenously inject this hormone four to six times per day to keep blood glucose levels under control'.

2. Page 2 line 101, the sentence 'We reviewed the current state of MH for diabetes management (14)' does not fit in the logic here. Suggest to remove it.

3. Page 4 line 115, 'backend HER systems' should be EHR.

Literature review

4. Page 4 line 145, 'Cappon et al. …' what is the findings of their study?

5. Page 4 line 140 to page 5 line 170, this long paragraph described a number of studies one by one. Comparison between these studies is needed to identify similarities, differences and gaps in the literature.
6. Page 6 line 206, what is the relevance of the study by Kan et al. to ontology?

7. Page 6 line 207, the authors mentioned the two ontologies they chose to use, but did not describe the existing relevant ontologies and the rationale of choosing these two.

8. Page 6 line 212 states there are considerable challenges facing the implementation of ontology-based CDSS. What are these challenges?

9. Page 8 line 279, please spell out 'ML technique' so readers can understand what it is.

Methods

Very detailed description of the development process. Well done.

Results

10. What are the results of evaluation by OOPS?

11. Table 6, how are the dimensions used to compare the existing ontologies developed?

Discussion

Discussed the implications of the findings in context of existing research and highlighted limitations of the study.

Conclusion

The whole study is well summarised and future research directions are identified.

The abbreviation issue:

12. Page 4 line 118-128, the abbreviations SSN, BFO, FHIR and CPG are used for the first time and should be provided with full names.
13. Many abbreviations that have been used before were spelled out in the Discussion section as if they were used for the first time.

14. There are many abbreviations used throughout the manuscript. Please consider to use full names for abbreviations used less than four times. Also, please provide a list of abbreviations at the end of the manuscript.

15. Please conform with the reference style of BMC Medical Informatics and Decision Making

16. Please improve the resolution of figures.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Unable to assess

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable
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