Reviewer’s report

Title: Advancing Laboratory Medicine in Hospitals through Health Information Exchange: A Survey of Specialist Physicians in Canada

Version: 0 Date: 05 Nov 2019

Reviewer: Mauricio Soto

Reviewer's report:

The article constitutes a contribution to the study of the use of one of the most important data sources in health information exchange systems, laboratory tests. It addresses a current problem, with a very good use of theories that can explain the extensive use and benefits of HIE. The proposed methodology is adequate and achieves very interesting results on how the benefits of an information technology determine its extensive use, and the components of the technology that are linked to these benefits and greater use.

However, a specially designed questionnaire was used for the study that has not been previously validated. At the same time, the validation is being used to evaluate constructs, which should be considered when analyzing the data.

Despite being familiar with methods of statistical analysis and validation of data collection instruments, the results section was very difficult for me to follow, which can make the messages that the authors are trying to convey lose strength.

Background

There is not a large amount that specifically addresses the use of the laboratory testing component in health information exchange systems from a clinical practice perspective. The background section states well the importance of this source of HIE clinical data and the need to better understand its extensive use as well as the benefits obtained in a hospital context.

Methods

The proposed methodology is suitable for established research questions.

The framework developed is consistent with those identified in the background and the three broad categories identified as contextual factors (users, technology and organization) correspond to what the literature on IT adoption and use consistently reports.
The methods section is brief, and much of the proposed statistical analysis is found in the results section.

When using an online questionnaire, the instrument validation issues are very important. The authors used a questionnaire specially designed for this study, which adds to the complexity of validation. The development was based on a review of previous literature and qualitative methods (interviews). There is no mention of whether a validation of the content of the instrument was carried out, a process that improves the formulation of the questions. The number of domains and items per domain is not specified. It is also not mentioned if a pilot application of the instrument was carried out. It is mentioned at the end of the section that an item analysis was performed to validate the two HIE use indexes and the internal validity of the two impact measurement scales of the use of HIE systems was evaluated with the Cronbach coefficient.

When reviewing the results, some statements are complex. For example: "As most of my patients reside in the region, I have little use for the QHR because the viewer provides me with most of the lab test results that I need (answers using a scale of Likert of 1 (strongly disagree) to 5 (strongly agree)). The question has several components, proportion of patients residing in the region, use of the QHR, benefits of use, in addition to the statement that may be difficult to understand.

In the results section (page 10, line 8) it is indicated that an evaluation of the psychometric properties of the construct indicator (measures) was carried out and details are given. Not being an expert I have doubts about whether it is sufficient to ensure the validity and reliability of the questionnaire used.

Results

The short explanation of the LRV and the iHIE can be moved to the methods section (page 7 line 21). A brief but better description is suggested, particularly of the differences between the RHIEP and the iHIE.

The results section mixes methodological details that may not be easily understood by clinicians, policymakers, educators, so we suggest reviewing them.

Table 1 is a mixture of contextual characteristics of participants and hospitals with data on the use of the different HIE (table two also contains these data), which makes it difficult to follow the text. A better option might be to separate them into two tables. It is interesting to note that there are no clinicians who do not use any of the systems which confirms the extensive use of them in relation to paper registration. The statement "retrieve lab results through more than one HIE system" (page 8 line 4) contains data from table 2, which is not yet entered in the text.
Table 2 is not adequately introduced and explained in the text, particularly when «HIE use cases» and «LRV use cases» notions are used. Later on we talk about HIE usage profiles, maybe this last concept is more relevant.

Table 3 is well introduced but contains a questionable statement: "possibility of electronically requesting a laboratory analysis is a capability that is available in only 55% of the LRV systems consulted by the SPs". In the table we can see that the statement also considers the ability to print the identification labels of the samples. We see then that the statement evaluates two functionalities.

The description of tables 3 and 4 is less confusing and contains very interesting information regarding the key functionalities of each system and the benefits obtained.

The description of table 5 and graph 2 are central to the article and perhaps deserve more space. It is noteworthy that there are no comments regarding the determination coefficients, very low in the case of "Extend of iHIE consultation". An explanation that the chosen variables "size" and "location" are only a small proportion of the contextual factors that the "hospital" organization may include.

The discussion is adequate, with the exception of the limitations of the study, which should be updated once more details of the questionnaire are incorporated (development, characteristics and validation).

I emphasize that in the discussion a very good point is made in the contributions of this study and what other research methodologies could contribute to this line of research.

Discussion

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I emphasize that in the discussion a very good point is made in the contributions of this study and what other research methodologies could contribute to this line of research.

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

No
Does the work include the necessary controls?
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Yes

Are the conclusions drawn adequately supported by the data shown?
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Yes

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