Review of the doctoral dissertation by Assaf Ben Shoshan, entitled:

„Home use medical devices: the user acceptance"

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In recent years, there has been a significant increase in the availability of many different ICT solutions available in medical care, such as systems using web or mobile applications, dedicated to specific groups of patients (with cardiovascular diseases, diabetes, etc.). Often, their main task is to educate, engage the patient in monitoring their health - which should contribute to the optimization of medical care, but also improve the quality of life of the patient. More and more mobile applications are dedicated to a very wide audience, not necessarily using medical care on a regular basis. Available applications often offer elements of basic diagnostics - either through the ability to measure and monitor basic parameters important for health (e.g. heart rate, blood pressure, breathing, number of steps, hours of sleep, etc.), or tests of a screening nature for possible further consultation with a doctor.

Studies show that these types of solutions are gaining popularity, which in turn encourages further development of technology in medicine. The availability of these solutions raises many questions among professionals, both representing different medical and IT fields - who is using these solutions and to what extent, how to provide good quality solutions that will be both attractive and easy to use for each recipient. However, research shows that older people use technological novelties less frequently - the problem of digital exclusion of this group is being discussed.

In the introductory section, the PhD student describes the history of the development of the concept of technology assessment and the key factors used in this assessment over the course of IT development. He points out the advantages and some gaps in the model, which still remains a recognized tool in assessing the usability and acceptance of technology - the so-called Technology Acceptance Model (TAM).

The aim of this research is an attempt to complement the TAM model with the influence of external variables, including those related to health and psychological conditions of the

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recipient, which can potentially determine the attitude and intention to use SB-HUMD (smartphone-based home use medical devices).

The originality of the work is determined by the use of elements of the salutogenic model in the approach to health and the identification of the subjects' level of coherence as a potentially predictive factor in the technology acceptance model.

The doctoral student thoroughly describes Antonovsky's salutogenic model dating back to the 1970s, which demonstrates his good theoretical preparation and knowledge of the issue. In his description of the salutogenic model, he particularly developed the Sense of Coherence (SOC), taking into account three key components of SOC: meaningfulness (motivational component); manageability (instrumental or behavioral component); comprehensibility (cognitive component).

The theoretical part, in my opinion, in an absolutely exhaustive way describes the issues being the subject of the research work, taking into account also known from the available literature connections of TAM and SOC with health condition or factors potentially modifying the results.

The Student concludes the theoretical issues by indicating the research questions (main and specific questions) and research hypotheses. I understand that it is the Doctoral Student's intention that the main research question simultaneously reflects the purpose of the work undertaken; the Objective section, on the other hand, is a summary justification of the topic undertaken rather than the objective itself. These are not objections; perhaps my comments are due to habitual terminology issues.

The PhD Student conducted the study in a group of more than 300 Hebrew-speaking volunteers, recruited from January to March 2020, via email and/or social media.

The group of respondents is selective and this is confirmed by the analysis of the respondents presented by the PhD Student. The predominant population is younger and middle-aged (under 60), with a secondary education, independent and generally healthy.

Understanding the limitations in terms of the possibility of conducting the research in this period and in no way diminishing the value of the research conducted, I would like to point out that the results obtained should be considered strictly in the context of the studied population, i.e.: the group using the Internet and mobile applications.

If I understand correctly, one of the exclusion criteria was a negative answer to the question: "If you would have had a smartphone-based device which allow at home monitoring/measuring of ANY parameter which may be currently measured at the nurses station, physician office or laboratory - would you use it?".

I will admit that I have some doubts about dropping this group from the study. In my opinion, it would be useful to know the profile of such a respondent - basic information, SOC survey and possible reasons for lack of interest in these devices.

In fact, the PhD Student included in the study people initially declaring interest in such devices - the description of the group in section 4.2 shows that only 5 people were excluded from the study due to lack of interest.

Out of my duty as a reviewer, let me point out the need to clarify a few things in the description of the survey methodology, for future publication:

1. the number of respondents finally included in the study - in the methodology section (p. 37: n=313, p. 38: n=310), as well as in the tables presenting the results - is inconsistent;

2. section "Sample size" - p. 37. I suppose it's just a minor spelling mistake, but since the margin of error is assumed to be 5% I understand that the confidence level is assumed to be 95%, not 90%;

2. the description of the group characteristics is the results obtained from the survey and should rather be included in the results section, in the group characteristics section.

In the results section, in an orderly way, the PhD Student presents further data on the association of external factors characterizing the group with TAM and SOC, and then the overall SOC score and its components with the TAM score.

One of the significant factors that the Student shows to be related to TAM is age - older adults are more likely to experience difficulty using devices and this is shown by the analysis in Table 17 (p. 65) - significantly lower values in older adults for Perceived Ease of Use (PEOU) than in younger respondents.

In the study group age was not found to determine other TAM components such as PU, BI and ATT - an interesting and promising observation. Considering the methodological limitations in the group selection and the small percentage of people aged 70 years and above, in my opinion, these data require further evaluation in a possibly unselected population of older people with various health problems and functional limitations.

Staying with the topic I raised about older people (in this study - people >47 years old), older respondents were characterized by higher scores for sense of coherence. Significant differences were seen especially in the cognitive (SOC-C, understanding) and behavioral (SOC-MA, resourcefulness) domains. The SOC-ME (meaningfulness) domain showed no significant difference between younger and older adults, and it was this domain that showed the strongest association with the TAM total score. This is also an important and promising finding that suggests to look for other factors in older people that limit the use of SB-HUMD applications.

Sense of meaningfulness (SOC-ME), according to the prediction model proposed by the Doctoral Student, is a variable that significantly predicts perceived ease of use (PEOU) and technology usability (PU). Undoubtedly, the conducted study shows new possibilities for assessing technology usability, but as the PhD Student himself states, the proposed model still needs to be verified in further studies.

The conclusions relate to the formulated research questions and do not raise my doubts, except for the possibility of their extrapolation to the general population.

The language of the work in terms of content and style does not raise objections.

Description of methods of statistical analysis is rather general, lack of information on the evaluation of the distribution of variables, description of some of the analyses conducted (e.g. ANOVA), description of the selection of variables for regression analysis. Some of this information was included but in the results section. My doubts are raised by the use of parametric correlation analysis (Pearson) when relationships between two ordinal variables were assessed.

The use of literature shows that the Doctoral Student demonstrates good knowledge of the discussed issue. The literature counts 85 items; there is no shortage of both historical and recent publications; the format of presentation of the literature is not entirely consistent.

There are 20 tables and 18 Figures. It would be helpful for a reader to see abbreviations, statistical tests and description of parameters in the Legend.

In conclusion, the paper is interesting and original given the topic undertaken and the results obtained, which due to some methodological limitations I would accept as preliminary.

My doubts concern also the choice of some statistical analyses and editorial issues of the presentation of results - in case of preparation of the publication I would recommend the above mentioned additions.

Regardless of the above remarks, which I have raised out of my duty as a reviewer, I would like to state that the dissertation presented by Assaf Ben Shoshan, M.Sc., "Home use medical devices: the user acceptance" fulfils the conditions for preparation of a doctoral thesis. I request that the Candidate be admitted to the further stages of the doctoral dissertation.

Krakow, 14th August 2021   Barbara Wizner