

45th Biennial Convention (16-20 November 2019)

Usability and Acceptability of a Mobile App for Emergency Room Providers: A Mixed-Methods Study

Shuhong Luo, EdD, MSN, RN

College of Nursing, SUNY Upstate Medical University, Syracuse, NY, USA

Objective

Clinical guideline adherence can improve patient outcomes. Because mobile apps are promising approaches to enhance providers' use of clinical guidelines, we designed and developed a mobile application called Sexual Assault Care Algorithm (SACA) for rapid decision-making and guidance for health care providers of child sex-abuse victims, especially those working in emergency rooms. This study provides a preliminary evaluation of the usability and acceptability of SACA.

Methods

We conducted an explanatory sequential mixed methods research design, which included an initial quantitative survey (including Post-Study System Usability Questionnaire and Acceptability e-Scale) and a follow-up qualitative study from interviews, observations, and documentation. Then we linked the qualitative data with the initial quantitative data to determine how the follow-up qualitative data help explain the initial quantitative results. The results were illustrated using a joint display table.

Results

Four providers completed the study. Both usability score (3.70 (SD, 1.21)) and acceptability score (3.79 (SD, 1.14)) were relatively high. Average time per question using SACA was 2 minutes, which is faster than using paper-based guidelines. The average accuracy rates were the same (67%) using both guidelines. The qualitative data provided insight into the initial survey results and helped identify areas to optimize.

Implications

These research findings provide important implications for future app revisions and training. We have already added information and explanations based on the participants' suggestions. We will design individualized training based on users' real-life workflow to give them a meaningful learning experience.

Conclusions

Our findings highlight the value of using a mixed methods research design to conduct a usability and acceptance test. Our data provide preliminary evidence of high usability and acceptability of SACA in a sample of providers and suggest that the mobile app has potential to improve provider's compliance with the decision-making guidelines for testing and treatment plans for children who might be sexually abused or assaulted. Information collected from this project was used to guide revisions to SACA.

Title:

Usability and Acceptability of a Mobile App for Emergency Room Providers: A Mixed-Methods Study

Keywords:

Child abuse, acceptance test and usability test

References:

1. Children's Advocacy Center Statistics. National Children's Alliance 2017 national statistics. *National Children's Alliance* (2017). Available at: <http://www.nationalchildrensalliance.org/wp-content/uploads/2018/03/2017NationalAnnual.pdf>.
2. Adams, J. A. *et al.* Updated guidelines for the medical assessment and care of children who may have been sexually abused. *J. Pediatr. Adolesc. Gynecol.***29**, 81–87 (2016).
3. Ventola, C. L. Mobile devices and apps for health care professionals: uses and benefits. *P T Peer-Rev. J. Formul. Manag.***39**, 356–364 (2014).
4. Luo, S. & Botash, A. S. Designing and developing a mobile app for Clinical Decision Support: An Interprofessional Collaboration. *CIN Comput. Inform. Nurs.***36**, 467–472 (2018).
5. Creswell, J. W. & Plano Clark, V. L. *Designing and conducting mixed methods research*. (SAGE, 2018).
6. Virzi, R. A. Refining the test phase of usability evaluation: How many subjects is enough? *Hum. Factors J. Hum. Factors Ergon. Soc.***34**, 457–468 (1992).
7. Fruhling, A. & Lee, S. Assessing the reliability, validity and adaptability of PSSUQ. in *AMCIS 2005 Proceedings* 378 (2005).
8. Tariman, J. D., Berry, D. L., Halpenny, B., Wolpin, S. & Schepp, K. Validation and testing of the acceptability e-scale for web-based patient-reported outcomes in cancer care. *Appl. Nurs. Res.***24**, 53–58 (2011).
9. Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Manag. Sci.***35**, 982–1003 (1989).
10. Sun, H. & Zhang, P. The role of moderating factors in user technology acceptance. *Int. J. Hum.-Comput. Stud.***64**, 53–78 (2006).
11. Luo, S. & Creswell, J. W. Designing and developing an app for a mixed methods research design approach. *Int. J. Des. Learn.***7**, (2016).
12. Eshet, Y. Digital literacy: A conceptual framework for survival skills in the digital era. *J. Educ. Multimed. Hypermedia***13**, 93–106 (2004).
13. Luo, S. & Kalman, M. A technology training protocol for meeting QSEN goals: Focusing on meaningful learning. *Nurs. Forum (Auckl.)***53**, 20–26 (2018).
14. Heselmans, A., Van de Velde, S., Donceel, P., Aertgeerts, B. & Ramaekers, D. Effectiveness of electronic guideline-based implementation systems in ambulatory care settings - a systematic review. *Implement. Sci.***4**, (2009).
15. Wheelan, S. A., Burchill, C. N. & Tilin, F. The link between teamwork and patients' outcomes in intensive care units. *Am. J. Crit. Care Off. Publ. Am. Assoc. Crit.-Care Nurses***12**, 527–534 (2003).
16. Chang, W.-Y., Ma, J.-C., Chiu, H.-T., Lin, K.-C. & Lee, P.-H. Job satisfaction and perceptions of quality of patient care, collaboration and teamwork in acute care hospitals. *J. Adv. Nurs.***65**, 1946–1955 (2009).
17. Bruning, R. H., Schraw, G. J. & Norby, M. M. *Cognitive psychology and instruction*. (Pearson, 2011).

18. Peek, S. T. M. *et al.* Factors influencing acceptance of technology for aging in place: A systematic review. *Int. J. Med. Inf.* **83**, 235–248 (2014).
19. Olson, K. E., O'Brien, M. A., Rogers, W. A. & Charness, N. Diffusion of Technology: Frequency of use for Younger and Older Adults. *Ageing Int.* **36**, 123–145 (2011).

Abstract Summary:

we designed and developed a mobile application for rapid decision-making and guidance for health care providers of child sex-abuse victims, especially those working in emergency rooms. This study provides a preliminary evaluation of the usability and acceptability of a mobile app.

Content Outline:

1. Introduction
2. Methods
 - 1) Research design
 - 2) Participants and setting
 - 3) Research procedures
 - 4) Data collection
 - a. Quantitative data collection: survey
 - b. Qualitative data collection
 - i). Observation
 - ii). Interview
 - iii). Documentation
 - 5) Data analyses
 - a. Quantitative phase
 - b. Qualitative phase
3. Results
 - 1) Demographic information
 - 2) Quantitative results
 - 3) Qualitative results
 - 4) Mixed methods results
4. Discussion
 - 1) High usability and acceptance
 - a. Ease of use
 - i). Feeling easy and comfortable
 - ii) Shorter time to complete app
 - iii) Positive emotion
 - b. Usefulness
 - i). Efficiently complete the tasks and scenarios
 - ii). Helpful in front of patients
 - iii). Helpful to teamwork
 - c. Optimize users' experience
 - i). Functions and capabilities
 - ii). Information
 - iii). Organization
 - iv). Error message

- v). Overall satisfaction rate
- d. Implications
- 5. Limitations
- 6. Conclusions

First Primary Presenting Author

Primary Presenting Author

Shuhong Luo, EdD, MSN, RN
SUNY Upstate Medical University
College of Nursing
Assistant Professor
Syracuse NY
USA

Author Summary: Dr. Shuhong Luo is an Assistant Professor in SUNY Upstate Medical University. Dr. Luo's research interests include implementing technologies (e.g. mobile apps) in healthcare and mixed methods research approach in nursing. Her major teaching role is in a text-based, asynchronous, online learning environment. Her goal of online teaching is to prepare the students to become self-motivated, lifelong learners.