

Introduction to Health Behavior Change Support Systems

Khin Than Win
University of Wollongong
Australia
win@uow.edu.au

Amanda Blok
University of Michigan
United States of America
acblok@umich.edu

Harri Oinas-Kukkonen
University of Oulu
Finland
harri.oinas-kukkonen@oulu.fi

More than ever, behaviour change perspectives play a significant role in healthcare management and personalized care. Health behavior change support systems (HBCSS) assist in disease prevention, health promotion and healthcare management [1]. To date, many studies have published with the HBCSS perspective [2], and have applied this perspective to persuasive technologies in biomedical informatics [3,4], health education and consumer engagement [5-7].

For our 2021 mini-track, six peer-reviewed manuscripts were accepted and further the science around HBCSS. Topics include health behaviour promotion, identifying the determinants of trust in information technology, and provide primary task support such as tailoring, personalization and behaviour change support through nudging users.

Chung et al. [8] presented health behaviour change support in breaking established habits and promoting healthy behaviours. The paper presented the theory-driven design principles for preventive action in the context of disease outbreaks.

Rahman et al. [9] studied Generation Z and Millennials' views on trust in healthcare technology, perceived benefits of technology and comfort with disclosure of personal health information. A healthcare technology trust calculus model is presented in their study and validated using quantitative data analysis.

Merrill et al. [10] pilot tested a smartphone application on a personalized feedback intervention for heavy alcohol users. This study reports the feasibility and acceptability of this personalized feedback for this population.

Self-management education for advanced cancer pain management was developed through a four-phase iterative process and was usability tested by Azizoddin et al. [11]. The study demonstrated health behaviour change support through a patient-centered mobile health application could improve a patient's experience in cancer pain management.

Ostern et al. [12] proposed a gamified design for adhering to Tuberculosis treatment. The application will support patient empowerment and community building. The paper presented their study on gamified system development using a design science research methodology.

Zetterholm et al. [13] presented their design thinking study on primary prevention of virus transmission during pandemics and how mobile solutions could assist in behavior change by utilizing the Nudge Theory.

Using an innovative combination of behavioural theory and mobile technology design, these papers present the contribution of HBCSS in multiple areas. Topics include disease self-management, support and empowerment for various populations, including those with a need for alcohol abstinence, cancer pain management, and tuberculosis treatment adherence [10-12], as well as the promotion of consumer trust in applications [9]. Recent events with the coronavirus disease 2019 (COVID-19) have influenced interest in the application of HBCSS on disease prevention during pandemics [8,13], proving the adaptability and strength of HBCSS in addressing real-world problems.

References

- [1] Win K.T., Roberts M.R.H, Oinas-Kukkonen, H, Persuasive system features in computer-mediated lifestyle modification interventions for physical activity, *Informatics for Health and Social Care*, 2019. 44(4): p. 376- 404, DOI: 10.1080/17538157.2018.1511565
- [2] Oinas-Kukkonen, H., A foundation for the study of behavior change support systems. *Personal and Ubiquitous Computing*, 2013. 17(6): p. 1223-1235.
- [3] Matthews, J., et al., Persuasive Technology in Mobile Applications Promoting Physical Activity: a Systematic Review. *Journal of Medical Systems*, 2016. 40(3): p. 1-13
- [4] Win K.T., et al., Persuasive Systems Design features in Promoting Medication Management for consumers, *Proceedings of the 50th Hawaii International Conference on System Sciences*, 2017, (pp. 3326-3335). HICSS.
- [5] Lehto T. & Oinas-Kukkonen H. (2011) Persuasive Features in Web-Based Alcohol and Smoking Interventions: A Systematic Review of the Literature. *Journal of Medical Internet Research*, 13(3), e46.
- [6] Karppinen P., et al. (2016) Persuasive User Experience in Health Behavior Change Support System:

A 12-month Study for Prevention of Metabolic Syndrome. *International Journal of Medical Informatics*, Vol. 96, December, pp. 51-61.

[7] Meedyia et al. Developing and testing a mobile application for breastfeeding support: The Milky Way application, *Women and Birth*, 2020, ISSN 1871-5192, <https://doi.org/10.1016/j.wombi.2020.02.006>.

[8] Chung et al., Designing Information Systems to Break Habits and Promote Preventive Behaviours During Large-Scale Disease Outbreaks, in this issue.

[9] Rahman et al., Toward Understanding the Technology Trust Calculus in Healthcare: A Generation Z and Millennial View, in this issue.

[10] Merrill et al., Piloting the Alcohol Feedback, Reflection, and Morning Evaluation (A-FRAME) Program : A Smartphone-delivered Alcohol Intervention, in this issue.

[11] Azizoddin et al., Leveraging Mobile Health Technology and Multidisciplinary Methodology to Optimize Self-Management Education for Advanced Cancer Pain: Development of STAMP, in this issue.

[12] Ostern et al, Designing a Gamified Adherence System for Tuberculosis Treatment Support in Urban Vietnam, in this issue.

[13] Zetterholm et al., Designing for Pandemics - a Design Concept based on Technology Mediated Nudging for Health Behavior Change, in this issue.