

## Recent Advances in the Design and Implementation of Health Behavior Change Support Systems

Khin Than Win  
University of Wollongong  
[win@uow.edu](mailto:win@uow.edu)

Harri Oinas-Kukkonen  
University of Oulu  
[harri.oinas-kukkonen@oulu.fi](mailto:harri.oinas-kukkonen@oulu.fi)

Sriram Iyengar  
Texas A&M University, USA  
[iyengar@medicine.tamhsc.edu](mailto:iyengar@medicine.tamhsc.edu)

Behavior Change Support Systems (BCSS), in general, are defined as "socio-technical information systems with psychological and behavioral outcomes designed to form, alter or reinforce attitudes, behaviors or an act of complying without using coercion or deception." [1] Thus, all BCSSs are persuasive systems, i.e. they have been designed with the intent to influence user behaviors. Health BCSSs provide a prominent area to apply persuasive systems design.

Chronic disease outcomes are determined by patient behavior and patient education is an important factor for changing patients' behavior. Applying effective design perspectives will assist in health behavior change perspectives [2]. Persuasion of users to improve physical activity would be different from persuading users to take medication or cease smoking [3]. Four research studies selected include specific area of health management for consumers. The studies included the presentation of current literature and new research results on exergaming for physical activity [4], medication management [5], design process of sleep health application [6] and the implementation program for inpatient smoking cessation [7].

Matallaoui et al. [4] presented their review results of persuasion of effectiveness of gamification for physical activity. Their study reviewed physical activity related serious exergaming, types and aims of the studies and their outcomes. They deployed motivational affordances and the corresponding results.

Win et al. [5] presented literature review results of persuasive technology in medication management applications for consumers. They have identified design features that are currently present in medication management applications and discussed about their importance.

Wilson et al. [6] presented the design process of sleep health BCSS. Design science approach is utilized in their study: conducting focus group, app review methods and formative user testing methods. The study demonstrates the importance of user context in

development of BCSS and the development process of BCSS sleep app.

Development of implementation program for of inpatient smoking cessation system was presented in Blok et al [7]. Formative evaluation was conducted to identify facilitator and barriers of the program. Health education and behavior change for patients will be supported through nurses' involvement in technology to patients.

### References

- [1] Oinas-Kukkonen, H., *A foundation for the study of behavior change support systems*. Personal and Ubiquitous Computing, 2013. **17**(6): p. 1223-1235.
- [2] Win, K.T., Hassan N.M, Oinas-Kukkonen H., Probst Y., *Online Patient Education for Chronic Disease Management: Consumer Perspectives*. Journal of Medical Systems, 2016. **40**(4): p. 1-13.
- [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] Matallaoui A., Koivisto J., Hamari J., Zarnekow R., How Effective Is "Exergamification"? A Systematic Review on the Effectiveness of Gamification Features in Exergames. In this issue.
- [5] Win K.T., Mullan J., Howard S., Oinas-Kukkonen H., *Persuasive Systems Design features in Promoting Medication Management for consumers*. In this issue.
- [6] Wilson E.V., Djasasbi S., Strong D., Ruiz C., *Using a Key Informant Focus Group, Formative User Testing, and Theory to Guide Design of a Sleep Health BCSS*. In this issue.
- [7] Blok A., Sadasivam R., Houston T., *Formative Evaluation to Determine Facilitators and Barriers to Nurse-driven Implementation: Designing an Inpatient mHealth Intervention to Support Smoking Cessation*. In this issue.