Introduction to Health Behavior Change Support Systems 2023

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

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

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 presented HBCSS perspectives [2].

For our 2023 mini-track, five peer-reviewed papers were accepted and further the science around HBCSS. The design and effect of digital technology, such as mobile applications and digital pill systems, were studied. Strategies often targeted users for ongoing engagement for persistent or pervasive problems. Assisting users to engage in medication adherence, mitigating stress, and compliance to public health policies were addressed. Design decisions around behavioral intervention use were explored further.

Medication adherence is central to chronic condition management and even prevention, yet accurately measuring adherence can be a challenge. One rigorous method is a digital pill system, but compliance is necessary for successful measurement. Lee and colleagues sought to understand the willingness of men who have sex with men (MSM) across diverse racial and ethnic identities to use a digital pill system to prevent HIV acquisition [3]. Their findings inform potential uses of the system for this population.

Stress management is necessary for a healthy lifestyle. Berger and colleagues sought to identify gamification elements that support users' adoption and long-term use of a mobile coping assistant [4]. Using a mixed methods approach of qualitative interviews of six users of a prototype, followed by a quantitative survey of preferences, gamification element preferences were identified. Elements most preferred included those providing feedback, such as scoreboards and progress bars. Related to academic stress, self-regulated learning may ameliorate a stress response. To support better learning behaviors, Steinherr and her team crated a mobile app and sought to understand ways to better promote user engagement [5]. Using a mixed methods approach of qualitative analysis and then quantitative surveys, 19 design requirements were identified to promote use.

Bolstering public health policy compliance using intrinsic motivation can avoid coercive strategies and promote a healthy way to foster engagement in the public. However, strategies to influence intrinsic motivation around policy compliance have largely been unexamined. Wallius and colleagues conducted an online experiment (exposure to vignettes) to determine design types, gameful experience and compliance individuals consider around social distancing in the COVID-19 era [6]. With a positive relationship between achievement and immersive gamification and compliance, a gameful experience mediates this relationship and signals a potential intervention type to support the public's intrinsic motivation to comply with public health policy.

Behavior change interventions can contribute to successful behavior change, yet it can be difficult to understand use of which components of the intervention contributed to the outcome. Using a mobile weight loss application, Agyei and colleagues quantitatively tested intervention component use on behavior change [7]. They found overall use of the intervention led to weight loss, as well as differences in intervention component use on successful weight loss. To be successful, users needed to complete 70% of several tasks, while 30% compliance of other tasks were sufficient for weight loss. Future work to detail optimal use pathways to assist individuals in achieving their behavior change goals is planned.

Using an innovative combination of behavioral theory and mobile technology design, these papers present the contribution of HBCSS for disease prevention, including medication adherence, stress, and compliance to public health policy.

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