Purpose: The purpose of this integrative review was to: 1) summarize the evidence of the effectiveness of mobile technology interventions for type 2 diabetes (T2DM) self-management in improving health outcomes and behavioral adherence; and 2) examine the characteristics of mHealth studies and interventions in T2DM self-management and the degree to which theory-based mHealth interventions have been used as a basis for developing existing diabetes applications.

Methods: In this integrative review of the literature, data were extracted from each selected study based on the purpose of the review. We searched PubMed for studies published only during the past five years; mHealth technologies have advanced and expanded rapidly and the intent of this review was to focus on the most recent technology advancements. The inclusion criteria for selection of studies were that each study: 1) targeted adults diagnosed with T2DM only; 2) was written in English and published during 2011-2015; 3) examined mHealth interventions designed for diabetes self-management; and 4) focused on physiologic outcomes (A1C, blood glucose [BG], blood pressure [BP], lipids, and weight), behavior adherence (diet, physical activity [PA], medication, glucose self-monitor, appointment keeping), or quality of life (QOL). We examined study characteristics e.g., study setting and design, purpose and length of the study, sample size and mean of age of participants, mobile device employed and mobile technology functions that were used, and whether the intervention was theory-based.

Findings: A total of 199 articles were located during the initial literature search. Screening yielded 27 articles that met inclusion criteria. The number of mHealth intervention studies increased each year over the past 5 years (9 studies in 2015, 7 in 2014 and in 2013, and 2 studies in 2012 and 2011). The studies reflected a wide variety of nationalities and settings. The average age of the samples across the studies was 56.8 years, and trended towards a younger population. All of the included studies reported positive findings related to glucose self-monitoring adherence. Eighteen of the studies included BG as an outcome and 94% reported positive findings. Fourteen of the studies measured A1C, with 79% reporting statistically significant improvements. More than 50% of the studies measured adherence to diet, PA, and medications; 80% reported positive improvements. A few studies measured BP (9), lipids (5), weight (8), appointment keeping (3), and QOL (8), and reported statistically significant improvements. Nine studies used theory-guided interventions, but there wasn’t a definite trend seen in the theory(ies) that investigators employed.

Conclusions: Based on the overall trends seen in the review of these studies on mHealth applications, mHealth seems to be a potentially effective tool in T2DM self-management. Studies reported improved key physiological outcomes, adherence factors, and quality of life. It’s well known that the theory-based self-management interventions are more effective than non-theory-based but no consistent theory(ies) was(were) used to inform these studies. Theory-based mHealth programs for diabetes self-management need further research. Physiologic markers of BP, lipids, and weight were not measured consistently in the majority of studies, suggesting further areas for future research.

Acknowledgement: We would like to acknowledge Dr. Box Xie, PhD, Associate Professor, School of Nursing & School of Information, The University of Texas at Austin, for her support and guidance.