Diabetes mellitus affects nearly 424.9 million adults worldwide, and is estimated to rise to over 628.6 million by 2040. Of this, type 2 diabetes mellitus (T2DM) accounts for about 90% of diabetes cases. 

Medication non-adherence is a common treatment issue and is associated with poor glucose control and consequently high complication rates and societal costs. 

Previous research has shown that technological interventions, such as mobile health applications and diabetes management websites, have the potential to impact diabetes self-management and quality of life. 

Technological advances can contribute to better management, but it is often difficult for engaged patients and maintenance of use of such interventions. 

**Objectives**

The aim was to review real-world studies that discuss engagement elements of telemedicine/mobile or health technological interventions focusing on T2DM. 

**Methods**

A systematic review protocol was used to define the eligibility criteria for the search and screening of references using the PICO(T) framework clearly by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. 

**Results**

The search in MEDLINE, Embase, and CENTRAL resulted in 5,767 potentially relevant references after duplicates were removed. 

5,008 references were excluded during title/abstract screening for reasons based on PICO criteria in Table 1. 11 full text references were assessed. Common reasons for exclusion at both title/abstract and full-text level were inappropriate study design, different intervention type or not reporting the outcomes of interest (see Figure 1 for the flow of studies through the review).

Patient engagement outcomes were underreported, and reported methodologies were heterogeneous across studies, making quantitative analysis of intervention adherence and persistence rates impossible. 

Variation in reporting is most likely due to differences in the interventions provided. 

Due to heterogeneity in reporting, intervention adherence estimates were not able to be contextualized in web-based programs, to 35-40% in telemedicine programs. 

Most studies did not report intervention adherence over time. However, in those that did, persistence outcomes were inconsistent across studies as clearly the variability in adherence methodology within the existing base. 

Intervention persistence outcomes were under-reported and only reported in 43% of studies; reporting methods were heterogeneous. 

Values varied based on measurement method. Some studies used duration of time actively using intervention, others used duration of time with any login, and another reported the proportion of patients still using the intervention at different follow-up times.

**Conclusions**

Adherence and persistence in digital health interventions for diabetes self-management are underreported and lack standard reporting methodology, which would be necessary to fully assess rates of use across intervention types. 

Patient centered and personally motivating messaging, as well as accessible, easy-to-use interventions, were most often cited by patients as reasons to use or continue using a diabetes digital health intervention.

Many of the technological interventions such as smartphones applications and patient web portals offer an opportunity to increase self-management in T2DM patients in order to reduce healthcare costs and improve care delivery.

**Limitations**

Due to the lack of data reported in the literature on patient preferences and potential barriers to diabetes technological engagement it is possible that results presented here do not represent all factors associated with these interventions. 

The focus of this evidence base is literature published within the last 10 years, it is possible that studies prior to 2007 that could provide useful insights to current technological interventions.

**Implications**

Understanding new technological interventions is important to consider with regard to patient adherence, especially in case of diabetes mellitus due to its high morbidity and mortality, challenges faced by healthcare providers, and evidence presented in this review. 

Political and governmental agencies should work towards increasing access to technological interventions for people with T2DM, mellitus. 

Practitioners’ need to develop and improve their technological knowledge to enhance engagement and self-management in people with diabetes through the use of technological interventions.

As healthcare providers are aware of the influence of the digital health interventions on diabetes management, they should be encouraged by policymakers, researchers, and funders to promote and develop technological interventions.

**References**


**Promoters and Barriers of Engagement in Type 2 Diabetes Mellitus Populations with Real World Technological Interventions**

Kavin Gokul, Angel Jimenez, Emily Morley, Robert Milton, Tolly Sajeev, Anne C. Beal .

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