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Populations, interventions, and outcomes in digital biomarker-based intervention systematic reviews: A scoping review

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Objectives

The purpose of this study is to examine the populations, interventions, and outcomes of systematic reviews of digital biomarker-based interventions.

Methods

The search timeframe was limited to 2019-2020 in PubMed and the Cochrane Library using the following search formula: "digital biomarker" OR "digital biomarkers" OR implantable OR implantables OR wearable OR wearables OR portable OR portables OR digestible OR digestibles. English full-text studies were searched to find systematic reviews (SRs) of digital biomarker-based interventions that included at least one human randomized controlled trial and reported changes in participants' health status. Two reviewers independently extracted data and screened titles/abstracts and full-text articles for compliance with the inclusion criteria. International Classification of Diseases (ICD-11), International Classification of Health Interventions (ICHI), and International Classification of Functioning, Disability, and Health (ICF) tools were used to categorize populations, interventions, and outcomes, respectively. Descriptive-analytical and tabular methodologies were employed to examine the data.

Results

The inclusion requirements were satisfied by 43 SRs. The populations were classified into nine ICD-11 chapters. Patients with XI Circulatory system (n=8, 19%) were the most common, followed by XXII external causes (n=6, 14%), IV Metabolic diseases (n=5, 12%), and XII Respiratory system (n=5, 12%). Nine SRs studied nonclinical populations (21%). Most digital biomarker-based interventions (n=7) for nonclinical populations were linked to health-related behaviors (physical activity). Mobility (n=7) also was the most applied intervention for Circulatory system patients. Looking after one's health (physical activity) (n=6) and weight maintenance functions (n=5) were the most often stated outcomes in nonclinical populations. Furthermore, Demographic change (mortality) (n=6) was the most commonly reported outcome in individuals with circulatory system problems.

Conclusions

Digital biomarker-based research is becoming more popular in various clinical settings and among the general public, with the primary goal of changing physical activity.

Figure 1. Disease areas were identified using the ICD-11 tool.

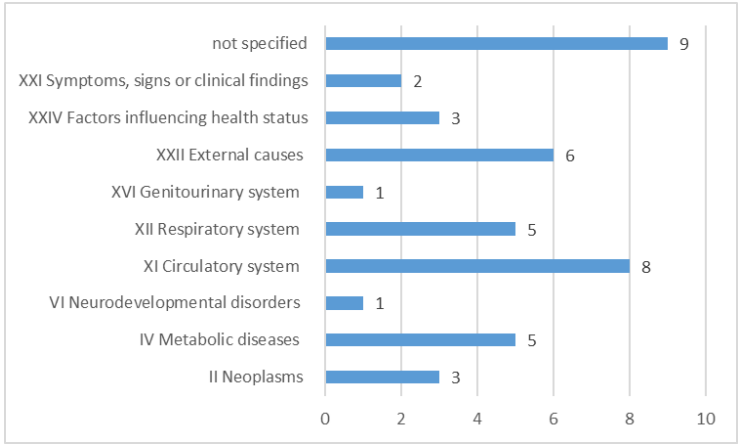
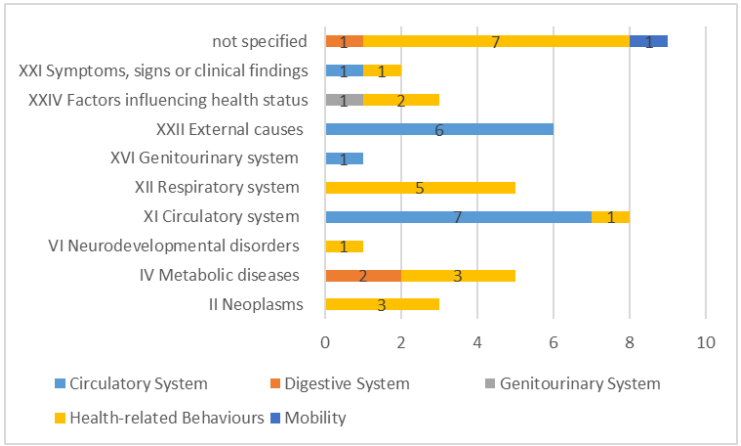


Figure 2. Categorization of interventions using ICHI tool in populations.



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