Child-focused mHealth apps used in collaborative, real-world interventions: A scoping review

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STUDY OBJECTIVE

This scoping review aimed to gather and synthesize existing literature related to rehabilitation-based mHealth apps used with children in real-world environments and as part of collaborative care models. For the purpose of this review, rehabilitation encompassed audiology and speech-language pathology (SLP), occupational therapy (OT) and physical therapy (PT), psychology, orthotics and prosthetics, and physical and rehabilitation medicine.[1] Collaborative care can help facilitate patient-centered health care and shared decision making[2], through direct patient involvement, paired with provider-directed care. Interventions conducted in "real-world" environments (outside of labs or simulated environments) can provide naturalistic and information-rich findings.

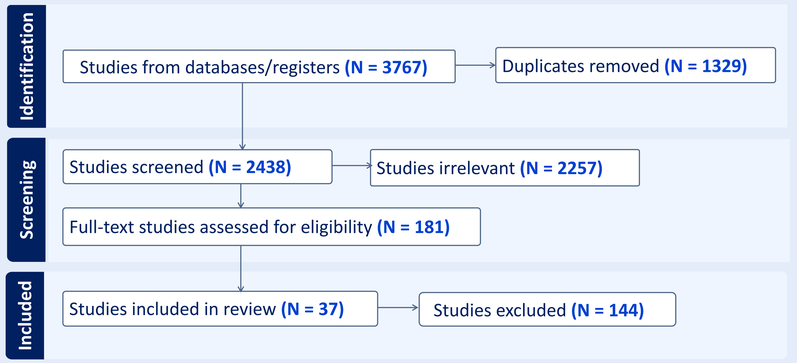
METHODS

The following databases were utilized to develop a full search strategy and obtain articles for this review: MEDLINE(R) ALL (Ovid), Embase and Embase Classic (Ovid), Nursing and Allied Health, Web of Science, Scopus and CINAHL (EBSCO).

Inclusion Criteria:
(1) published/accessible in the English-language; (2) accessible electronically; (3) peer-reviewed; (4) available in full-text; (5) an original research article; (6) describing a care context including the use of mHealth apps; (7) guiding real-world treatment/intervention; (8) care beyond assessment/screening only; (9) care including pediatric populations; and (10) app-use co-led by a healthcare professional within rehabilitation sciences with direct patient (child) manipulation of the app as part of the intervention.

Following the Joanna Briggs Institute (JBI) methodology[3] and using the Covidence platform[4], two independent reviewers assessed all articles at each phase. Conflicts were resolved by a moderator or through team discussion.

Figure 1. PRISMA Flow Diagram[5]



RESULTS*

Included articles originated mostly from North America (Figure 2) and reported on intervention studies including pediatric participants, with an average age of 10.38 years (R = 2.9 – 18). A total of 19 pilot studies were included, with the remaining 18 studies specific to randomized-controlled trials, non-randomized experiments, cohort or case series, and clinical trial designs. Rehabilitation professionals involved in the identified studies included audiologists (1), SLPs (15), OTs (10), PTs (4), psychologists (15), physical medicine/rehabilitation doctors (2), and general rehabilitation professionals (2). A variety of contexts and care scenarios were reported (Tables 1 & 2), on incorporating mobile device use (smartphones, tablets, and iPods) as part of intervention studies targeting a range of childhood health conditions (Figure 3). Child-led mobile app use included both passive and active interaction components (Figure 4).

Table 1. Real-World, Physical Context of App Use

Home-based	At school	Clinic-based	Other
20	7	13	3

Table 2. Care Scenario

During therapy session	Daily life use	Targeted behaviour/situation	Other
14	13	16	1

Figure 2. Origins of Included Studies

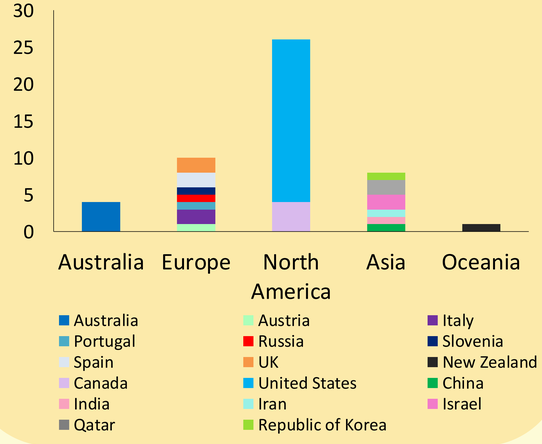


Figure 3. Childhood Health Condition

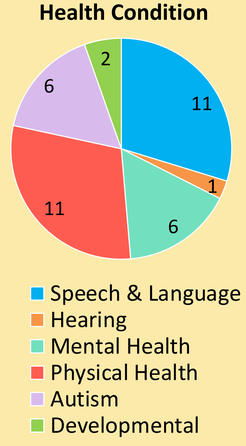
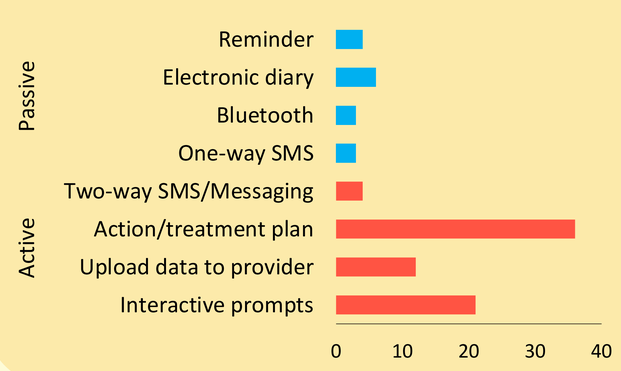


Figure 4. Interactive App Features



*Note: All summaries are related to the number of studies (N) included in this review.

CONCLUSIONS

Just over half of the included articles were pilot or efficacy studies, relating to the novelty of the use of child-focused mHealth apps as part of rehabilitation-based interventions. Only a limited number of interventions assessed the quality and/or safety of the app(s). Active interactive app features were more common than passive, with action/treatment plan and interactive prompts being used most often. Repetitive content, lack of motivation, technical difficulties and limited/no access to support were perceived as barriers to app engagement. Conversely, gamification and guiding/coaching led to greater app use and as a result increased engagement in care. The benefit of mobile apps is that they allow care to take place in a variety of environments that are convenient to the end-user. Overall, the findings from this review suggest that the use of mHealth apps as part of interventions led to a greater desire to participate and increased child engagement in the care process.

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