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IMPACT OF DIGITAL INTERVENTIONS ON MAINTENANCE TREATMENT ADHERENCE IN ASTHMA: A SYSTEMATIC LITERATURE REVIEW (SLR) AND META-ANALYSIS

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CONCLUSIONS

- The findings demonstrated that an increase in adherence may be achieved through digital interventions in both adult and adolescent patients with asthma
- Digital intervention is a novel approach to overcome the challenges associated with poor adherence to maintenance treatment and thus, reduce morbidity, mortality, and cost burden of chronic diseases like asthma

BACKGROUND

- Globally, 339 million people suffer from asthma which is one of the most common chronic diseases
- The adherence to maintenance medication remains poor regardless of effective treatments such as inhaled corticosteroids (ICS)
- With digital health advancing over the last few years, asthma management has become more personalized and optimal

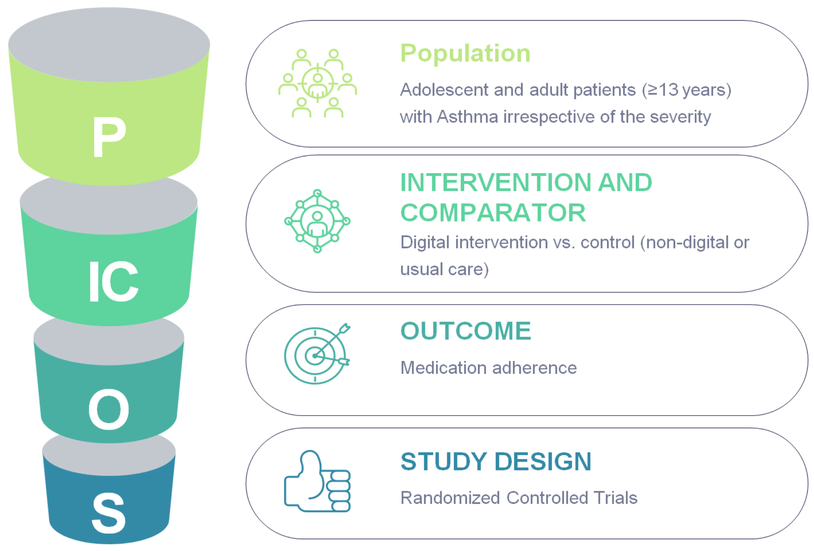
OBJECTIVE

To determine the influence of digital interventions to improve maintenance medication adherence in adolescent and adult patients with asthma

METHODOLOGY

- The review followed the standard methodology for conducting reviews as per National Institute for Health and Care Excellence (NICE, Cochrane Handbook, and PRISMA guidelines
- Embase®, MEDLINE®, CENTRAL®, and Cochrane Airways were searched from database inception to June 2022 to identify randomized controlled trials (RCT) reporting percentage medication adherence with digital interventions versus non-digital control among patients with asthma (aged ≥13 years). Fig 1 presents the eligibility criteria for selection of evidence

Figure 1: Prespecified PICOS eligibility criteria for selection of evidence

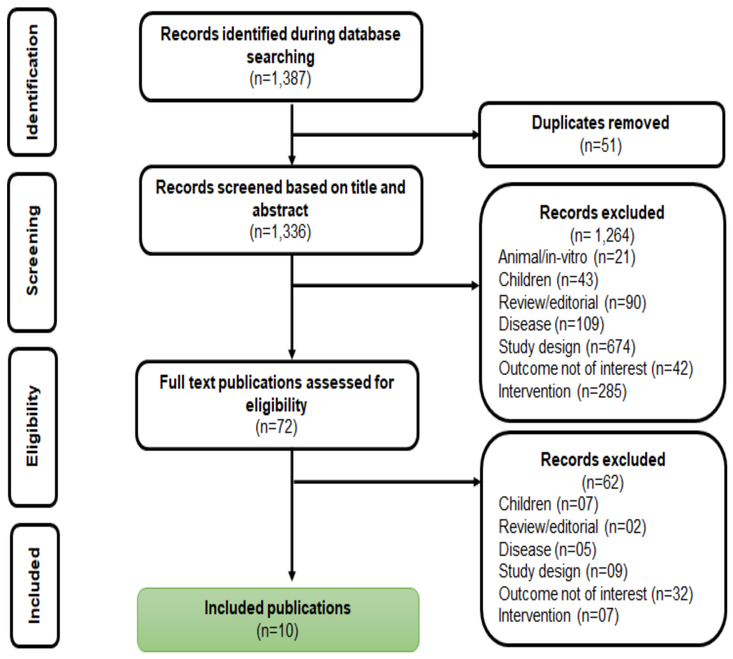


- The risk of bias assessment was performed using Cochrane's RoB-2 tool
- The SLR followed a standard two review and quality control process for data collection and extractions

RESULTS

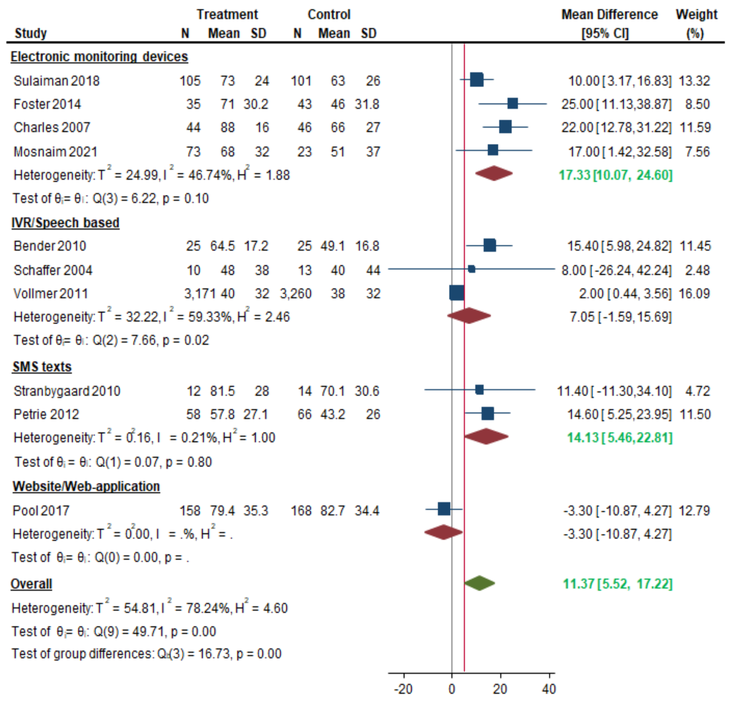
- A PRISMA diagram for the screening process is presented in Fig 2
- Out of 1,387 screened publications, 10 RCTs met the inclusion criteria and were included in the meta-analysis

Figure 2: PRISMA diagram for the screening process



- The median number of asthma patients included across 10 RCTs was 93, range 23 [2] to 6,431 [5]
- The study follow-up range from 10 weeks [1] to 72 weeks [5]
- The majority of studies included adult (age ≥18 years) patients (7 studies), while adolescent + adult (age 13-65 years) patients were assessed in three studies
- The digital interventions comprised, electronic monitoring devices (n=4), interactive voice response/speech (n=3), text messages (n=2) and web-portal/application (n=1)
- The pooled results from the meta-analysis revealed a statistically significant increase in adherence to maintenance medications among the recipients of digital interventions (mean difference: 11.37%, 95% CI 5.52% to 17.22%) compared to the control group [Fig 3]
- In a subgroup analysis, electronic monitoring devices were associated with higher improvement in adherence to maintenance medications followed by text messages, interactive voice response/speech, and web portal/ applications [Fig 3]

Figure 3: Forest plot of comparison between digital intervention vs. control/usual care*



***Statistically significant**; *Random-effects Sidik-Jonkman model;*
Thresholds for the interpretation of I^2 can be misleading since the importance of inconsistency depends on several factors. A rough guide to interpretation is as follows: 0% to 40%: might not be important; 30% to 60%: may represent moderate heterogeneity; 50% to 90%: may represent substantial heterogeneity; 75% to 100%: considerable heterogeneity (Cochrane handbook)
CI: Confidence Interval; N: Sample size; SD: Standard Deviation

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Disclosure
SA, BS, the authors, declare that they have no conflict of interest

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