

Table 1 Data summary

STUDY DESCRIPTION	STUDY FINDINGS
<p>JEMINIWA 2019</p> <p>SYSTEMATIC REVIEW AND META-ANALYSIS</p> <p>FIVE DATABASES SEARCH FROM INCEPTION UNTIL AUGUST 2018</p> <p>EHEALTH AMONG CHILDREN AND ADULT ASTHMATIC PATIENTS</p> <p>VS.</p> <p>USUAL CARE OR WITHOUT EHEALTH INTERVENTION</p> <p>OUTCOME MEASURES</p> <p>THE EFFECTIVENESS OF EHEALTH ON ADHERENCE TO ICS AND THE TYPES OF EHEALTH IN USE</p>	<p>eHealth</p> <p>Pros (+)</p> <p>All categories of eHealth across different technologies used for monitoring adherence yielded a small effect on adherence (SMD 0.41, 95% CI 0.02–0.79), and was more significant in studies utilizing EMDs to measure adherence (SMD 1.19, 95% CI 0.49–1.89).</p> <p>mHealth</p> <p>Pros (+)</p> <p>Significant effect on adherence (SMD 0.96, 95% CI 0.28–1.64) across mHealth studies using different methods in monitoring adherence and significant across mHealth studies utilizing EMDs to monitor adherence (SMD 1.28, 95% CI 0.41–2.14) and self-reports (SMD 0.52, 95% CI 0.23–0.82).</p> <p>eHealth</p> <p>Cons (-)</p> <p>Insignificant effect on adherence in studies utilizing pharmacy refill data to monitor adherence (SMD -0.13, 95% CI -0.70 – 0.44) or self-report (SMD 0.25, 95% CI -0.10 – 0.60), or electronic health records, interactive voice response, telephone calls by HCP (SMD 0.20, 95% CI -0.02 – 0.43).</p>
<p>BOUTOPOULOU 2018</p> <p>SYSTEMATIC REVIEW</p> <p>FOUR DATABASES SEARCH FROM JANUARY 2012 TO MARCH OF 2018</p> <p>MEDICATION ADHERENCE INTERVENTIONS AMONG SEVERE ASTHMA CHILDREN</p> <p>VS.</p> <p>WITHOUT ADHERENCE INTERVENTIONS</p> <p>OUTCOME MEASURES</p> <p>INFLUENCE OF ADHERENCE INTERVENTIONS</p>	<p>EMDs</p> <p>Pros (+)</p> <p>One prospective observational cohort study monitored adherence rates over median of 92 days interval following EMDs technology for 93 severe outpatient asthmatic children.</p> <p>The adherence rate baseline was (median 74% (21%-99%). Post EMDs, ≥80% adherence rate for 39 patients, 60-79% adherence rate for 25 patients (42%), and <60% adherence rate for 29 patients (31%).</p> <p>Cons (-)</p> <p>Suboptimal adherence (adherence rate <80%) remained prevalent among all children with severe asthma representing 58%.</p>

<p>PEARCE 2022 ANARRATIVE SYSTEMATIC REVIEW</p> <p>SIX DATABASES SEARCH FROM INCEPTION UNTIL OCTOBER 2020</p> <p>ADHERENCE INTERVENTION AMONG ASTHMATIC CHILDREN TO ICS WITH AT LEAST ONE OUTCOME MEASURE OF ADHERENCE VS. USUAL TREATMENT OR A BASIC EDUCATION</p> <p>OUTCOME MEASURES ICS ADHERENCE INTERVENTIONS IN CHILDREN WITH ASTHMA AND CHARACTERISTICS OF SUCCESSFUL ADHERENCE INTERVENTIONS</p>	<p>EMDs</p> <p>Pros (+) EMDs with audio-visual enabled Vs. EMDs with audio-visual disabled, after 6 months resulted in median adherence of 84% in the EMDs enabled group (10th percentile 54%, 90th percentile 96%), compared with 30% in the EMDs disabled group (8%, 68%) (P<0.0001). EMDs with feedback was compared to EMDs alone. The EMDs with feedback group achieved higher adherence than control (median adherence for the Intervention group was 70% vs. 49% for the control group) (p <0.001). Another study found mean percentage adherence for EMDs with feedback= 79% vs. 57.9% for EMDs without feedback (P< 0.01).</p> <p>mHealth</p> <p>Cons (-) mHealth (text message reminder with a tip about the value of regular controller use) Vs. control group (receiving only two reminders to sync their sensors). The unadjusted MD: control = 40% vs. mHealth= 34% (P=0.56). Adjusting mean adherence for age and parental education (control=32% vs mHealth=36%, P=0.73).</p> <p>eHealth</p> <p>Cons (-) A web-based interactive education and monitoring system including education, self-monitoring, and rewards Vs. control (receiving an asthma education manual). Mean change since adherence rate baseline (38%) for intervention 11.2% increase vs. control= 4.4% decrease (P=0.67).</p>
<p>LEE 2021 SYSTEMATIC REVIEW AND META-ANALYSIS</p> <p>SEVEN DATABASES SEARCH FROM INCEPTION UNTIL APRIL 2021</p> <p>EMD VS. USUAL CARE</p> <p>OUTCOME MEASURES INHALER ADHERENCE AND CLINICAL OUTCOMES</p>	<p>EMDs</p> <p>Pros (+) EMDs group was 1.50 times (RR = 1.50, 95% CI 1.19–1.90) more likely to adhere to inhalers VS. control (P<0.001) with medium-to-large effect size (g=0.64). Significant improvement in Children Asthma Control Test (C-ACT) in EMDs group (P=0.02) with a small effect size (g=0.33).</p> <p>Cons (-) No significant differences in asthma exacerbation events per year (risk ratio 0.89, 95% CI 0.45–1.75) (P=0.72), or asthma control using ACQ scores (Z -0.91, P=0.36) and ACT scores (Z 0.95, P=0.34).</p>

<p>CHAN 2022 SYSTEMATIC REVIEW AND META-ANALYSIS</p> <p>SEARCH FOR CLINICAL TRIALS FROM THE COCHRANE AIRWAYS TRIALS REGISTER FROM FROM INCEPTION UNTIL JUNE 2020</p> <p>DIGITAL INTERVENTIONS AMONG CHILDREN AND ADULT ASTHMATIC PATIENTS VS. ANY NON-DIGITAL INTERVENTIONS</p> <p>OUTCOME MEASURES ADHERENCE ASTHMA CONTROL ASTHMA EXACERBATIONS UNSCHEDULED GP VISITS TIME OFF SCHOOL, WORK DUE TO ASTHMA LUNG FUNCTION QUALITY OF LIFE COST-EFFECTIVENESS ADVERSE EVENTS</p>	<p>Digital interventions</p> <p>Pros (+) Adherence rate improved by almost 15% with the use of digital technologies Vs. control (MD 14.66%, 95% CI 7.74 to 21.57). Asthma control as change from baseline of various scales improve by a small (SMD 0.31, 95% CI 0.17 to 0.44). Asthma exacerbations (≥ 1 asthma exacerbation) reduced (risk ratio 0.53, 95% CI 0.32 to 0.91) (P=0.02). Quality of life increased (SMD 0.26 higher, 95% CI 0.07 to 0.45) (P=0.007).</p> <p>EMDs & mHealth</p> <p>Pros (+) Adherence improved better with EMDs (MD 23% higher, 95% CI 10.84 to 34.16) (P=0.0002) compared to control group. Adherence improved better with short message services (SMS) (MD 12% higher, 95% CI 6.22 to 18.03) (P< 0.0001) compared to control group. No significant subgroup differences for participant age ranging from 2 to 98 years old, for a total of 15,207 participants from 30 studies.</p> <p>Cons (-) No significant subgroup differences in FEV1. No data on missed school or workdays, cost-effectiveness, or adverse events.</p>
<p>BERG 1998 A RANDOMIZED, CONTROLLED STUDY</p> <p>SIX-WEEK SELF- MANAGEMENT PROGRAM.</p> <p>31 ADULTS WITH ASTHMA USING MDI CHRONOLOG VS. 24 ADULTS WITH ASTHMA USING ASTHMA DIARY NOTES</p> <p>OUTCOME MEASURES ADHERENCE SCORES</p>	<p>EMDs (MDI Chronolog)</p> <p>Pros (+) Adherence rates measured by MDI Chronolog showed 26% of the experimental group had > 80% adherence rates Vs. 4% in the control group.</p> <p>Cons (-) In each arm of intervention, self-reported adherence rates were higher than the monitored adherence rates.</p>