## Table 1 Data summary

<table>
<thead>
<tr>
<th>STUDY DESCRIPTION</th>
<th>STUDY FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JEMINIWA 2019</strong></td>
<td>eHealth</td>
</tr>
<tr>
<td>SYSTEMATIC REVIEW AND META-ANALYSIS</td>
<td>Pros (+) 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).</td>
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<tr>
<td>FIVE DATABASES SEARCH FROM INCEPTION UNTIL AUGUST 2018</td>
<td><strong>mHealth</strong> Pros (+) 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).</td>
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<tr>
<td>EHEALTH AMONG CHILDREN AND ADULT ASTHMATIC PATIENTS VS. USUAL CARE OR WITHOUT EHEALTH INTERVENTION</td>
<td><strong>eHealth</strong> Cons (-) 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).</td>
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<tr>
<td><strong>OUTCOME MEASURES</strong></td>
<td><strong>EMDs</strong> Pros (+) One prospective observational cohort study monitored adherence rates over median of 92 days interval following EMDs technology for 93 severe outpatient asthmatic children. 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 &lt;60% adherence rate for 29 patients (31%). <strong>Cons (-)</strong> Suboptimal adherence (adherence rate &lt;80%) remained prevalent among all children with severe asthma representing 58%.</td>
</tr>
<tr>
<td>THE EFFECTIVENESS OF EHEALTH ON ADHERENCE TO ICS AND THE TYPES OF EHEALTH IN USE</td>
<td></td>
</tr>
</tbody>
</table>
PEARCE 2022
ANARRATIVE SYSTEMATIC REVIEW
SIX DATABASES SEARCH FROM INCEPTION UNTIL OCTOBER 2020
ADHERENCE INTERVENTION AMONG ASTHMATIC CHILDREN TO ICS WITH AT LEAST ONE OUTCOME MEASURE OF ADHERENCE VS. USUAL TREATMENT OR A BASIC EDUCATION
OUTCOME MEASURES
ICS ADHERENCE INTERVENTIONS IN CHILDREN WITH ASTHMA AND CHARACTERISTICS OF SUCCESSFUL ADHERENCE INTERVENTIONS

EMDs
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).

mHealth
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).

eHealth
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).

LEE 2021
SYSTEMATIC REVIEW AND META-ANALYSIS
SEVEN DATABASES SEARCH FROM INCEPTION UNTIL APRIL 2021
EMD VS. USUAL CARE
OUTCOME MEASURES
INHALER ADHERENCE AND CLINICAL OUTCOMES

EMDs
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).

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).
### CHAN 2022
**SYSTEMATIC REVIEW AND META-ANALYSIS**
**SEARCH FOR CLINICAL TRIALS FROM THE COCHRANE AIRWAYS TRIALS REGISTER FROM INCEPTION UNTIL JUNE 2020**
**DIGITAL INTERVENTIONS AMONG CHILDREN AND ADULT ASTHMATIC PATIENTS VS. ANY NON-DIGITAL INTERVENTIONS**
**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

### Digital interventions
**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).

**EMDs & mHealth**
**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.

**Cons (-)**
- No significant subgroup differences for participant age ranging from 2 to 98 years old, for a total of 15,207 participants from 30 studies.

**BERG 1998**
**A RANDOMIZED, CONTROLLED STUDY**
**SIX-WEEK SELF-MANAGEMENT PROGRAM.**
**31 ADULTS WITH ASThma USING MDI CHRONOLOG VS. 24 ADULTS WITH ASThma USING ASThma DIARY NOTES**
**OUTCOME MEASURES**
- Adherence scores

**EMDs (MDI Chronolog)**
**Pros (+)**
- Adherence rates measured by MDI Chronolog showed 26% of the experimental group had > 80% adherence rates Vs. 4% in the control group.

**Cons (-)**
- In each arm of intervention, self-reported adherence rates were higher than the monitored adherence rates.