INPLASY

Effectiveness of Digital Health Technology Interventions for Patients with Asthma: A Systematic Review and Meta Analysis

INPLASY202660041
doi: 10.37766/inplasy2026.6.0041
Received: 8 June 2026
Published: 8 June 2026

Jiang, L ; He, X; Wang, X; Lu, T; Zhou, LJ.

Corresponding author:
Lijuan Zhou

zlj18200383036@163.com

Author Affiliation:
Sichuan Provincial People's Hospital, School of Medicine,University of Electronic Science and Technology of China, Chengdu, China.

ADMINISTRATIVE INFORMATION

Support - Sichuan Province Social Science Key Research Base Research center of undertakings for the aged (project number: XJLL2025024).

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202660041

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 June 2026 and was last updated on 8 June 2026.

INTRODUCTION

Review question / Objective The aim of this study was to investigate the effects of digital health technologies (DHTs) interventions on disease control, quality of life, lung function, acute exacerbation events, hospital readmission rates, and treatment adherence in patients with asthma, and to evaluate their clinical effectiveness, thereby contributing to improved disease management and better prognosis for asthma patients.

Condition being studied Asthma is one of the most prevalent chronic respiratory diseases, characterized by reversible airflow limitation and chronic airway inflammation. Globally, the disease affects approximately 300 million people, with a prevalence of around 8% among adults in the United States. In recent years, the incidence and prevalence of asthma have shown a steady upward trend.

METHODS

Participant or population Asthma patients.

Intervention Utilizing digital health technologies.

Comparator Not Utilizing digital health technologies.

Study designs to be included RCT,Prospective retrospective, cohort studies.

Eligibility criteria Studies were eligible for inclusion if they met the following criteria: (1) Patients had a confirmed diagnosis of asthma based on current clinical guidelines, with consideration of medical history, examination findings, and multidisciplinary discussion when necessary. (2) Study designs included randomized controlled trials, prospective cohort studies, or retrospective cohort studies. (3) Articles were published in English. (4) For studies on digital

health technology (DHT) interventions in asthma, continuous variables were extracted as Mean±Standard Deviation (SD) or were obtainable through calculation or transformation; binary variables were extracted as the number of events (n) and total sample size (N) in each group; if the Risk Ratio (RR) and its 95% Confidence Interval (CI) were not directly reported, they had to be obtainable or transformable via algorithmic methods.

Studies were excluded if they met any of the following criteria: duplicate publications; being case reports, conference abstracts, commentaries, meta analyses, animal or cell studies, or letters; lacking relevance to asthma or digital health interventions; providing insufficient data for effect size extraction or missing key effect estimates; or being published in a language other than English.

Information sources PubMed, Embase, Cochrane Library, Web of Science, Scopus, and Ovid databases.

Main outcome(s) ACT scores, FeNO levels, FEV1%, AQLQ scores,PEF levels, Emergency Department and Urgent Care, hospital readmission rate, treatment adherence.

Quality assessment / Risk of bias analysis Newcastle-Ottawa Scale (NOS).

Strategy of data synthesis Data was analyzed using stata software.All studies that performed pooled analysis
were initially tested for heterogeneity using Cochran's Q statistic and inconsistency value (I2). If a p-value of <0.05 or I2≥50% indicated remarkable heterogeneity, a random-effect model and the DerSimonian–Laird (DL) method were ultimately. employed to synthesize the data.

Subgroup analysis ACTscores, AQLQ scores, and FEV1% were stratified by patient age, whereas readmission risk was evaluated according to the time interval to readmission (less than 12 months versus 12 months or more).

Sensitivity analysis Sensitivity analyses were performed by the stata software to reflect the sensitivity of an article by the change in the effect size after excluding that article.

Country(ies) involved China.

Keywords Asthma; Digital health technologies (DHTs); Effectiveness; Meta analysis.

Contributions of each author
Author 1 - Lei Jiang.
Author 2 - Xing He.
Author 3 - Xuan Wang.
Author 4 - Ting Lu.
Author 5 - Lijuan Zhou.