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Original Research Article

Effectiveness of Telehealth in Metered Dose Inhaler Use in Asthma Patient

Saif K. Alkhanferi, BPharm[1*], Saleh Z. Alqahtani, BPharm[2], Arwa N. Alonazi, BPharm[3], Saleh M. Alhrooby, BPharm[4], Hassan A. Salami, Rph[2], Khulaif H. Alanazi[3], PharmTech, Faten H. Almutiri, BPharm[5], Mohammad G. Alshamri, BSc, PharmD, MSc[6], Fahhad M. Alshammari, Rph[7], Monawer Alenezi, Rph[8], Ahmad F. Aldaferi PharmTech[9]

[1]Pharmaceutical Care Department, Imam Abdulrahman Bin Faisal Hospital, National Guard Health Affair, Dammam, Saudi Arabia
[2]Pharmaceutical Care Department, King Abdulaziz Hospital, Alahsa, Saudi Arabia
[3]Pharmaceutical Care Department, King Fahd Specialist Hospital, Buraydah, Saudi Arabia
[4]Pharmaceutical Care Department, King Fahad Specialist Hospital- Dammam, Saudi Arabia
[5]Pharmaceutical Care Department, Bukariyah General Hospital, Bukariyah, Saudi Arabia
[6]Pharmaceutical Care Department, King Khalid Hospital- Hail, Saudi Arabia
[7]Medical Supply- Hail, Saudi Arabia
[8]Medical Supply, Arar, Saudi Arabia
[9]Assistant Department for Compliance in Hafar AlBatin

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***Corresponding Author:** Saif K. Alkhanferi
Pharmaceutical Care Department, Imam Abdulrahman Bin Faisal Hospital, National Guard Health Affair, Dammam, Saudi Arabia

Abstract

Bronchial asthma is a chronic disease of respiratory system that distresses loads of people universally. The most frequent and backbone therapy for asthma is breathe in or inhalation treatment, which is conveyed via variable devices. It is well evidenced that accurate technique of inhalation is critical for their effectiveness. Nevertheless, numerous individuals with asthma use their inhaler devices incorrectly, which can decrease the efficacy of the treatment and cause suboptimal control of asthma. Telehealth is a briskly emergent field that has the possibility to advance inhaler technique and asthma control in variable ways. Telehealth could represent valued means for developing inhaler maneuver and delivering other bronchial asthma healthcare services. Our study will review the significance of telehealth in delivery of instruction of inhaler to bronchial asthma patients and in control of bronchial asthma. Providing instruction on inhaler use through different methods such as telephone, web camera, and smart devices applications. Advantages and disadvantages of telehealth in asthma management will be discusses too.

Keywords: Asthma, metered dose inhaler, technique, administration, telehealth.

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INTRODUCTION

Bronchial Asthma is a chronic inflammatory condition that affects the respiratory airways. It has been found up to 10% of people all around the world. Bronchial asthma sign and symptoms range from minor to severe, and are defined as recurring episodes of shortness of breath, wheezing, coughing, and chest tightness. The most often used therapy for bronchial asthma is inhaled treatment, which is delivered through a variety of procedures. They work by delivering medications directly to the airway network, which aids in the opening of congested airways and the reduction of inflammation [1, 2].

Inhalers are an important part of bronchial asthma treatment since they deliver bronchodilators and anti-inflammatory medications. Metered dose inhaler (MDI), dry powder inhaler (DPI), and nebulizers are the three main types of inhalers. MDIs are small devices that encapsulate a medicinal container that is under pressure. To use an MDI, the patient must take a deep breath while pressing down on the container. DPIs work by releasing a dry medicine powder that the patient inhales. Nebulizers are machines that use a compressor to turn liquid treatments into vapor. The patient then just breathes in the steam produced by the nebulizer [2-4].

Appropriate inhaler device method is critical for the efficiency of drug inhalation. However, many people with bronchial asthma do not use their nebulizers correctly. A growing body of evidence suggests that simple inhaler technique is a major source of difficulty in bronchial asthma management. According to studies, around 50% - 70% of people with asthma do not use their inhaler devices correctly. This may result in decreased treatment efficacy, worse asthma symptoms, and an increased risk of severe asthma attacks [5, 6].

Poor inhaler technique can result in inadequate control of asthma symptoms. According to a prior study, only 23% of patients were able to use MDI correctly after receiving instruction. In an Egyptian study, 44.7% of MDIs were handled incorrectly. In a study of children with asthma, only 8-22% used their inhalers appropriately [7, 8].

Telehealth is the use of telecommunications to provide health services at a distance. It is a rapidly expanding discipline with the potential to develop inhaler practice and bronchial asthma care in a variety of ways. Telehealth allows healthcare providers to deliver remote care to patients, potentially overcoming barriers to healthcare services such as distance, transportation, and child childcare [9, 10].

Telehealth can be used to provide a variety of services for bronchial asthma control, such as inhaler device technique instruction, bronchial asthma education, asthma symptoms monitoring, and exacerbation management.

METHODS

A literature search was conducted in Google Scholar and PubMed databases for articles published between 2010 and 2018. The search words were asthma, metered dose inhaler, technique, administration, and telehealth. Research inclusion criteria were limited to English and adult or children with asthma. While exclusion criteria were studies that were not peer reviewed and not report on the effectiveness of telehealth in improving inhaler technique or asthma control.

RESULTS

After analyzing the title, abstract, and full text of 32 papers, a total of 5 research were included in this study based on inclusion and exclusion criteria. The research was carried out in the different countries over the world such as United States, Canada, Europe, and Asia. A total of 951 people took part in the studies. The research was carried out in a variety of contexts, including primary care, advanced health care facilities, and academic institutions. The studies used several telehealth approaches, such as phone calls, web cameras, and smart device applications, among others.

The outcomes of the review showed that telehealth was effective in teaching inhaler technique to children and adults with bronchial asthma. Telehealth, according to the analysis, can be a beneficial tool for developing asthma control. It can assist patients in learning how to properly use their inhaler devices, improving asthma control and minimizing the likelihood of an asthma exacerbation. It can also assist patients in maintaining communication with their healthcare professionals, ensuring that they are receiving the appropriate care.

Table 1: Summary of included studies

Author	Title	Abstract
Liu W, *et al*., (2011) [11]	A mobile telephone-based interactive self-care system improves asthma control	In this study, 43 patients were assigned to the mobile phone group as opposed to the control group. The study found that using a mobile phone for self-care boosted the average daily dose of inhaler treatment considerably.
Carpenter DM, *et al*., (2015) [12]	Using videos to teach children inhaler technique: a pilot randomized controlled trial	This randomized, controlled pilot trial on 46 children compared a brief video intervention offered following an office visit to a control group. The technique used in the study resulted in an immediate improvement in the inhaler's design.
Portnoy JM, *et al*., (2016) [13]	Telemedicine is as effective as in-person visits for patients with asthma	This study compares asthma outcomes in 69 children managed by telehealth to 100 children with in-person visits over a 6-month period. The study discovered equivalent results in both groups and suggested that telehealth can be used to control asthma.
Perry TT, *et al.*, (2018) [14]	Results of an Asthma Education Program Delivered via Telemedicine in Rural Schools	This study examines the influence of telehealth education programs in rural schools on 393 asthma patients. The evidence for behavioral changes was insufficient.
Halterman JS, *et al*., (2018) [15	Effect of the School-Based Telemedicine Enhanced Asthma Management (SB-TEAM) Program on Asthma Morbidity A Randomized Clinical Trial	A randomized clinical trial of 400 children was done to evaluate telehealth program management of asthma. The study discovered that the telehealth program improved asthma control.

DISCUSSION

According to the findings of this review, telehealth can be an active means of developing inhaler use and asthma management. It can be especially beneficial for persons who live in remote locations or who have difficulty accessing in person care.

There is emerging evidence to suggest the utility of telemedicine/telehealth in educating inhaler device technique in bronchial asthma patients. Studies showed that patients who received education and training through videoconferencing or smart phone calls inhaler had been improved their inhaler device technique and improved their asthma sing and symptoms significantly. In one study, children with asthma who got telehealth training improved their technique significantly [15].

Furthermore, another study discovered that asthmatic patients who received telehealth-based asthma control services had better asthma management than those who received traditional care. Telehealth was also found to be effective in improving asthma control in children and adults. In addition, it found that telehealth was cost-effective in asthma control [11, 13].

Some factors that contribute to the effectiveness of telehealth in improving inhaler device technique and asthma management include Videoconferencing, education, and self-management. Videoconferencing allows the healthcare worker to observe the patient's technique while using the inhaler and respond immediately. Educational can assist patients in learning how to use their inhalation devices correctly through videos, descriptive paper (flayer). Finally, using a self-management smart phone and monitoring tools could help patients track their asthma symptoms and adjust their therapy as needed.

Meanwhile, the benefits of using telehealth in teaching inhaler technique add in patient’s convenience as asthmatic patients can get such instruction at comfort of their own homes and at any time. Ease access also for patients living in rural or remote areas or even for those who is working for long periods of time at night or day shifts.

Regardless of the potential benefits of telehealth, there are some limitations and challenges to overcome, such as electronic devices cost and how to make it affordable and accessible to all patients, trained health care service providers and patients to use such technologies, and the infrastructure required for telemedicine support such as internet webs.

Telehealth have a bright future in asthma management. As such telehealth technology advance, they will most likely become more affordable and widely available. This increases the likelihood that more patients will receive proper inhaler training.

CONCLUSION

Inhaler treatment is an important aspect of asthma management. A poor inhaler technique can reduce the efficacy of therapy, exacerbate symptoms, and increase the risk of exacerbation. According to the findings of this review, telehealth is a promising method for developing inhaler technique and asthma management. Telehealth can be especially beneficial for persons who live in remote locations or who have difficulty accessing in person care. As telehealth technology advances, it is likely that it will be employed more widely in asthma management. More research is needed to back up these findings and establish the best way to deliver inhaler education and asthma control via telehealth

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