

Chapter 8

Identifying the Components of a Smart Health Ecosystem for Asthma Patients: A Systematic Literature Review and Conceptual Framework

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ABSTRACT

With asthma being one of the leading causes of death in different countries, the emphasis on improving the health of asthma patients is important. While the use of smart technologies is a good approach for improving the health of asthma patients, technologies need to be connected in such a way that all components of smart health form an ecosystem. However, the components of such an ecosystem have not been identified in the current literature. The purpose of this chapter was to identify the components of a smart health ecosystem for asthma patients through a systematic literature review. A total of 28 articles met the inclusion criteria. This chapter identified the components of a smart health ecosystem for asthma patients and provided a conceptual framework. The findings of the systematic literature review are expected to inform researchers on the components required for building a smart health ecosystem for asthma patients.

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INTRODUCTION

Asthma is a chronic disease affecting people in different parts of the world (Sinharoy et al. 2018). One of the causes of high prevalence of asthma attacks could be unfavorable weather conditions, lack of medications that have a positive impact on asthma attack in some countries (Sinharoy et al. 2018) and air pollution (Guarnieri and Balmes, 2014). The number of asthma deaths occurring each year is estimated to be about 250,000 (D'Amato et al., 2016). Approximately 300 million people suffer from asthma globally and is a leading cause of disability (Global Initiative for Asthma, 2014; The Global Asthma Report, 2014; World Health Organisation, 2007).

With this growing trend, researchers have developed technologies to improve health conditions for asthma patients. For example, AsthmaGuide, an asthma monitoring system which allows medical practitioners access patient information from a distant location (Ra et al., 2016). Monitoring mechanisms (Kwan et al., 2014, Seto et al., 2009) and prevention mechanisms through technology have been developed (Seto et al., 2009). An emerging term for such applications is “smart health” (Sundaravadivel et al., 2018). According to Sundaravadivel et al. (2018), smart health enables patients to take charge of their health through constant monitoring. Iyawa et al. (2016a) and Iyawa et al. (2016b) suggest that digital health enables patients to keep track of their health by using wearable and wireless technologies and Rahmani et al. (2018) admit that an ecosystem is relevant in providing meaningful care.

Despite the advancement of patient care through wearables and wireless technologies, these technologies need to be connected. These components of smart health should form an ecosystem in which asthma patients, medical practitioners and technologies can communicate at remote locations. Existing literature support the benefits of having a smart health ecosystem. For example, Chang and West (2006) present a digital ecosystem as an ecosystem that enables the interactions of different components in a digital platform. McLaughlin et al. (2009) are of the opinion that components of a digital ecosystem should work together to share knowledge. The literature further suggests that these benefits are not limited by location (Briscoe and De Wilde (2006). The purpose of this chapter was, therefore, to provide a systematic literature review on the components of smart health ecosystem for asthma patients and, using these findings, provide a conceptual framework of a smart health ecosystem for asthma patients. The findings of the study contribute to the growing body of knowledge on smart health specifically for asthma patients. Further, this study could provide a better understanding of what is required in developing a smart health ecosystem for asthma patients. The remainder of this chapter is structured as follows: Research Methodology, Results, Discussion, Conclusion and Future Work.

RESEARCH METHODOLOGY

Research Questions

The methodology applied in the chapter is the systematic literature review. The systematic literature review aimed to answer two research questions (RQ):

1. What is a smart health ecosystem for asthma patients?
2. What are the components of a smart health ecosystem for asthma patients?

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