Mobile Health to Support Ageing in Place: A Systematic Review of Reviews and Meta-Analyses

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ABSTRACT

The study reported in this article aimed to identify: i) the most relevant application domains of mHealth to support older adults in their domiciles; ii) the most relevant chronic conditions of older adults, whose management is being supported by mHealth; iii) the characteristics, outcomes and impacts of mHealth tools that might support older adults in their domiciles. The method of a systematic review of reviews and meta-analyses was performed based on a search of the literature. The result of a total of 66 reviews and meta-analyses across several chronic diseases were retrieved. These studies compare mHealth interventions with usual care. The conclusion is that mHealth interventions have positive effects on various health related outcomes, but further research is required to allow their incorporation in the clinical practice.

KEYWORDS
Chronic Conditions, mHealth, Mobile Health, Older Adults

1. INTRODUCTION

A concern in our ageing world is the unsustainable pressure on public spending, particularly the rising of health and social costs. In this context, technological solutions emerge as potentially cost-effective to promote the reorganization of the care provision. This is the aim of mHealth (i.e. health services and information delivered or enhanced through mobile devices).

Mobile applications, due to several factors, including gradual comprehensive coverage of mobile and smartphones in everyday life, availability of applications, wireless broadband access, and the fact of being tethered to the individual, have gotten special attention in terms of their potential to support the care provision (Davis, DiClemente & Prietula, 2016). In this respect, the present article aims to provide a systematic review of the current state-of-the-art of mHealth solutions to support older adults in their residential environments (i.e. ageing in place (Connelly, Mokhtari & Falk, 2014; Normie, 2011)), which is useful to older adults, practitioners, and researchers (Queirós, Cerqueira, Santos & Rocha, 2017).

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2. METHODS

For the purposes of the present study, mHealth include any mobile equipment (e.g. mobile phones, smartphones, tablets, or other devices connected by wireless technology) and services (e.g. Short Messaging Service - SMS - , Multimedia Messaging Service - MMS - or special purpose applications). These products and services allow symptom monitoring, self-care management and facilitate access to care knowledge and patient-provider communication (Hamine, Gerth-Guyette, Faulx, Green & Ginsburg, 2015).

The systematic review of the present study was informed by the following research questions:

- What are the most relevant application domains of mHealth to support older adults in their domiciles?
- How can mHealth be used to manage chronic conditions of older adults?
- What are the characteristics, outcomes and impacts of mHealth tools that might support older adults in their domiciles?

Since a large number of articles have been published, this study included systematic reviews or meta-analyses only.

In order to determine the most appropriate search strategy, an initial scoping study was conducted, and its outcomes were discussed with other researchers and captured in a review protocol with explicit descriptions of the methods to be used and the steps to be taken.

The queries were prepared to include: i) all the reviews and meta-analysis where any of the keywords ‘telecare,’ ‘telemedicine,’ ‘homecare,’ ‘telehealth,’ ‘telemonitoring,’ ‘remote monitoring,’ ‘telerehabilitation,’ ‘ehealth,’ ‘mobile health,’ ‘mhealth,’ or ‘assisted living’ were present in the title or abstract; and ii) all the reviews and meta-analysis where any of the keywords ‘information technology,’ ‘information and communication,’ ‘technology-based,’ ‘internet-based,’ ‘web-based,’ ‘on-line,’ ‘mobile phone,’ ‘smartphones,’ ‘mobile apps,’ ‘monitoring devices,’ or ‘consumer health information’ were present in the title or abstract together with any of the keywords ‘healthcare,’ ‘health care,’ ‘patient,’ or ‘chronic condition’.

Employing Boolean phrases, the literature search was performed in two general databases (Web of Science and Scopus) and two specific databases (PubMed, a medical-related database, and IEEE Explorer, a technological database) on January 2018.

In terms of inclusion criteria, it was considered reviews and meta-analysis related to mHealth solutions published during the preceding 10 years, and that can be used in home care services to support older adults, including older adults with chronic diseases. Considering the exclusion criteria, the authors aimed to exclude systematic reviews of reviews or meta-analysis that are not published in English, or that report solutions that: i) target health conditions not related to older adults (e.g. pediatric conditions); ii) do not target the older adults (e.g. studies that are clinicians focused or are intended primary to deal with the problems of caregivers rather than the patients); and iii) are designed to be used in an institutional environment and not in the domicile of the older adults.

After the removal of duplicates and articles not published in English, the selection of the remainder articles was performed by two authors in three steps: i) first, the authors assessed all titles for relevance and those clearly not meeting the inclusion criteria were removed; ii) afterwards the abstracts of the retrieved articles were assessed against the inclusion and exclusion criteria, and several articles were removed; and iii) finally, the authors assessed the full text of the remainder articles according to the outlined inclusion and exclusion criteria. In all these three steps any disagreement between the two authors was discussed and resolved by consensus.
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