Headache App: Usability Assessment and Criterion Validity

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ABSTRACT

Mobile applications show great potential for the assessment and registration of information regarding headaches. However, data on the content and usability of mobile applications for headache that are accessible to the public in European Portuguese are scarce, as well the criterion validity. Therefore, this article aims to search for and characterize the mobile applications related to headache in terms of content, usability and criterion validity. A search in the Android app store of applications was conducted. Four mobile applications were found in European Portuguese that matched a set of predefined criteria. These were characterized in terms of general characteristics, content, usability and criterion validity. Three of the applications were specific for headaches and one could be used for any type of pain, including headache. All applications allowed recording of pain characteristics and its extraction in a form of a report. In the discussion section several challenges related to the use of mobile applications in the assessment and management of headache are discussed.

KEYWORDS:
European Portuguese, Headache, Mobile Applications, Usability

INTRODUCTION

The World Health Organization (WHO) defines mobile health (mHealth) technologies as a component of eHealth. mHealth covers medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants, and other wireless devices (WHO, 2011). It is an emerging and rapidly developing field that can contribute to the transformation of healthcare and increase its quality and efficiency while simultaneously containing costs (de la Vega & Miró, 2014).

According to the Food and Drug Administration (FDA), the mobile applications for health should: i) help people (which means the users of the app) monitoring their health conditions without providing treatment suggestions; ii) provide simple tools to organize and control health information; provide easy access to information related with health; iii) help to document the health conditions, making this easier to share information with the health providers; iv) automate simple tasks for health care providers; and v) be intended to transfer, store and display medical data (FDA, 2013).

The adoption of mobile applications on a continuous basis can be affected by some barriers like the lack of confidence among patients, healthcare professionals and citizens regarding their reliability and their ability to accurately measure what is intended. Therefore, special attention should be given
to them, before making them available to the general public and/or health professionals, especially if they have the potential to be a source of harm in normal use or have the potential to be misused (Queirós et al., 2016).

Regulations should effectively address issues such as certification of devices as well as applications. In addition, clinical usefulness is also an important issue for patients, citizens and healthcare professional’s acceptance (EC, 2014). Clinical usefulness can be defined as to whether using the application results in any benefit for the patient such as more accurate diagnosis or more appropriate care (Silva, Queirós, Caravau, Ferreira, & Rocha, 2016). It depends on other aspects such as whether the application is measuring what it is intended to measure (validity), whether measurements taken with the application are consistent across repeated measurements in similar conditions (reliability) (Streiner & Norman 2003). In addition, the experience of the end user when using the application and its ease of use (usability) can also be a barrier or a facilitator when considering the use of mobile applications. This means that before the use of an application can be considered and results trusted a broaden assessment of this application, from different but complementary perspectives, should be undertaken. It is assumed that this assessment performed as an interactive process should be performed by interdisciplinary teams constituted by professionals from different areas (e.g. informatics, health) and end users to improve the likelihood of the applications to be used.

RELATED WORK

According to the International Headache Society (IHS, 2013), headaches are classified as primary headaches (Migraine, Tension-type headache, Trigeminal autonomic cephalalgias and other primary headache disorders) and secondary headaches (headaches attributed to trauma, injury, disorder or other condition). The prevalence of headache disorders among adults defined as symptomatic at least once within the last year is about 50% and about one third of adults aged 18–65 years have reported at least one episode of migraine (WHO, 2016). The Global Burden of Disease Survey 2010 (Vos et al., 2013) estimated that tension-type headache and migraine have a global prevalence of 20.1% and 14.7%, respectively, and are ranked as second and third most common diseases in the world. Migraine was recognized as the seventh highest among specific causes of disability.

A study on the impact of headache in Europe (Steiner et al., 2014) conducted across 15 different countries and a total of 8,271 participants revealed that the one-year prevalence of any headache was 79.6%, being slightly higher in females (86.0%) when compared to males (71.1%). Personal headache impact was assessed using a set of seven questions (encompassing areas such as the impact of headache on education, career prospects, earnings, relationships, work). Results showed that headaches negatively impact all these areas of life and are associated with a significant loss of useful time (17.7% of males and 28.0% of females with migraine lost >10% of days), which have implications for health policy and a high socioeconomic burden.

Wöber-Bingöl et al. (2014) in their study also refer to the impact of headache in children and adolescents. Their study results showed that 20.7% of the participants with headache reported to have lost at least one day of school and 48.8% reported that there was at least one day that they were unable to do the activities they had wanted to due to headache. Also, participants who reported headache also reported lower quality of life when compared to participants that did not report headaches.

The International association for the Study of Pain has published in December 2013 a clinical update recognizing the importance of mobile technology in managing chronic pain as a means to improve access to healthcare, contain costs and improve clinical outcomes (Vardeh, 2013). However, this publication also highlights the need to evaluate existing solutions.

Several authors suggest that mobile applications will have a crucial role in the future in maintaining social relationships, health and well-being (Mikkonen, Va, Ikonen, & Heikkila, 2002). However, mobile applications for health should go through a process of assessment in order to guarantee the quality and accuracy of its content as well as its usability (Boulos, Brewer, Karimkhani, Buller, &
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