
Persuasive Technologies for Increasing Adherence to Physical Therapy

Jonas Geuens

e-Media Lab
KU Leuven
Andreas Vesaliusstraat 13,
Leuven, Belgium
jonas.geuens@kuleuven.be

Luc Geurts

e-Media Lab
KU Leuven
Andreas Vesaliusstraat 13,
Leuven, Belgium
luc.geurts@kuleuven.be

Vero Vanden Abeele

e-Media Lab
KU Leuven
Andreas Vesaliusstraat 13,
Leuven, Belgium
vero.vandenabeele@kuleuven.be

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Abstract

Adherence to physical therapy is low. This abstract describes a persuasive system that aims to engage patients into doing their physical therapy both through personalized persuasive strategies and through context-awareness.

Author Keywords

Persuasive systems; physical therapy; context-awareness

ACM Classification Keywords

H.5.2. User-centered design

Introduction

“Increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments.”[1]

Adherence is defined as the extent to which the patient’s behavior matches the recommendations that have been agreed upon with the prescriber [2]. Adherence to therapy is an ongoing problem that has drawn the attention of several health organizations [3], [4]. In particular in Chronic Arthritis (CA; umbrella term for inflammatory musculoskeletal diseases such as rheumatoid arthritis, osteoarthritis and

spondyloarthritis), evidence shows that adherence to physical therapy is low [5], [6]. CA is highly prevalent, 20% of the adult US population suffers from a self-reported doctor-diagnosed form of arthritis [7] and is typically associated with processes of joint inflammation and destruction, causing joint pain, swelling, stiffness and instability or bony ankylosis. While effective anti-rheumatic drugs have become available, treatment recommendations include physical therapy programs to improve cardiovascular endurance, muscle strength, posture and movement control, range of motion, and balance [8]–[11]. Plenty of evidence suggests that exercise has strong benefits [12]–[14], particularly when sustained over a prolonged time [15]. Unfortunately, between 35 and 75% of CA patients fail to adhere to physical activity recommendations of their therapist [16]–[18]. In addition to arthritis-specific barriers (e.g. pain, disability), personal (e.g. lack of motivation) and contextual barriers (e.g. lack of facilities) play a crucial role [19], [20].

It is here that a persuasive system, defined as a “computerized software or information system designed to reinforce, change or shape attitudes or behaviors or both without using coercion or deception”, might be beneficial [21], [22]. Persuasive systems might include persuasive strategies such as goal setting, praise, self-monitoring, normative beliefs, etc. to mold people’s behavior [23]. Persuasive principles in mHealth applications also underscore a more cost-effective health care where patients are empowered to take control over their health through self-care.

Unfortunately, contemporary mHealth applications are rarely designed as persuasive systems. In the past

year, we carried out a systematic review of such persuasive strategies embedded in mHealth and eHealth applications for the management of CA. We found that the use of persuasive strategies was limited and lacking intelligence [24]. The offered strategies were **nor personalized, nor context-aware**, and the adoption of these apps by CA patients was missing. Other review studies besides ours equally argue that this results in technology that has a low impact on health care practices [25]–[27], and in particular presents challenges with respect to high dropout rates [28] rather than strengthening adherence.

The question remains how to design such an intelligent persuasive system that takes into account the progression and fluctuation of a patients’ disease [30], the specific ability and desired therapeutic goals, [31],[31] the socio-physical environment and the individual preferences. This is where this PhD research wants to make a difference, and aims to develop and implement a personalized, context-aware persuasive system for CA patients, to increase adherence to their physical therapy programs.

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