

E-Health and Psychology: Self-Regulation to Help Software Design

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INTRODUCTION

The promotion of healthy habits during adolescence to better protect the young ones from a range of health risks is critical for countries' health, their social cohesion and for the prevention of health problems in adulthood. Behavior linked diseases such as obesity are a recurrent concern, and are becoming increasingly common among the youngest (WHO, 2012). Other examples are diabetes and tobacco consumption. Globally, the proportion of years of life lost (YLL) resulting from non-communicable diseases (NCDs) has increased from 38% in 2000 to 47% in 2012, and among the leading causes of YLL, ischaemic heart disease and stroke were two of the three top causes behind YLL increase between 2000 and 2012 (WHO, 2014a)(WHO, 2014b). As the authors see it, behavioral change in health is a central element in preventative health policies, a vision supported by European authorities (WHO, 2008).

In a joint Declaration, UN Major Groups & Stakeholders from civil society (*65th Annual DPI/NGO Conference Outcome Document Declaration*, 2014) stated that physical and mental health and psychosocial well-being are essential for all people and they support the notion that these are interlinked with ensuring quality education, ending poverty and other goals (*Outcome Document... Sustainable Development Knowledge Platform*, 2014).

The use of behavioral change techniques and the development of protection skills such as decision making, a healthy self-esteem and peer pressure resistance serve as mental health promoters in teenagers, as stated in the Mental Health Action Plan 2013-2020 (WHO, 2013).

Promotion and prevention are key actions that the international community has agreed upon (WHO, 1986). Psychological interventions can change behaviors, and behaviors are core to several health problems. They can be used to: influence biological change that occurs after emotional response to behavior pattern; change risky behaviors or promote protective behaviors; and work on behaviors in the presence of a disease in areas such as adherence, monitoring, surveillance or even helping in the decision to take care (Baum & Posluszny, 1999).

Politicians and managers usually see patients' decisions and their underlying habits, as rational and logical, but they usually are not (Rice, 2013). Taking this into account we need to develop strategies based on the knowledge of how people behave, think and feel - areas that are at the center of psychology studies and concerns.

The above-mentioned Mental Health Action Plan calls for the promotion of self-care through electronic and mobile technologies in health. Mobile apps and Internet-enabled mobile devices are starting to

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change health care delivery. Because of this, governance software application developers and providers must consider smartphones as a key target (Kickbusch & Gleicher, 2014).

Internet and smartphones (mobile phones in general) users are growing fast. The number of mobile phone users was 4.08 billion in 2012, corresponding to 58,2% of the world population. In 2013, the number was already 4.33 billion, or 61,1% of the world population. The number of smartphone (computer phones such as Android smartphones) users is also huge; in 2013, they were 1.43 billion, or 20,2% of world population and 33% of total mobile phone users. 1.91 billion access the Internet with their mobile phone, corresponding to 44,1% of mobile phone users (EMarketer, 2014). The number of fixed Internet broadband subscribers in 2013 was 4.61 billion (World Bank, 2014). That is why this has become an accessible worldwide mode of healthcare services delivery. Smartphones are user-friendly devices, multi-function and always with us and online ('always on') (Kamel Boulos, Wheeler, Tavares, & Jones, 2011).

Europe's strategies concerning the future of health are consistent with health system sustainability and the need for ways to ensure mass behavioral change and universal health systems (*Health 2020: a European policy framework supporting action across government and society for health and well-being*, 2013), (Kickbusch & Gleicher, 2014). This requires that health professionals such as psychologists develop their role from focusing mainly in individual interventions, to become 'choice architects', working on changing people's behavior by promoting and adapting choice details (Apfel, Tsouros, Kickbusch, & Pelikan, 2013). This work can be done, for instance, by supporting health apps development or human machine usability aspects in Web health platforms. E-Health is needed to ensure mass interventions that promote healthier life styles (Norman, Zabinski, Adams, Rosenberg, Yaroch, & Atienza, 2007).

Designing e-health solutions without the help of psychology experts and without the science of psychology does not properly address the needs to be able to use instruments, strategies and their conception, and the requirements for planning, execution and evaluation in order to achieve more behavioral change efficiency in health when adapting technology to humans (Alcañiz, Botella, Baños, Zaragoza, & Guixeres, 2009).

The importance of both e-health and self-regulation for the development of technological solutions and for an effective gamification that can change behaviors and contribute to a healthier life style (Scholz, Nagy, Schüz, & Ziegelmann, 2008), inspired the authors of this chapter to propose self-regulation as a standard for software application design combined with gamification.

BACKGROUND

These YLL data presented above are a consequence of habits associated with lifestyles in both rich and developing countries. Ingestion of food high in sugar and fat and a more sedentary way of living are strong contributors to these results (WHO, 2014b). Health inequalities are also linked to health-related behavior, including tobacco and alcohol use, diet, physical activity and mental problems, which are reflected in stress and other forms of disadvantage in people's lives (*Health 2020: a European policy framework supporting action across government and society for health and well-being*, 2013).

These facts coupled with a changing demography, with more elderly people than ever before, jeopardize health systems resources (Rechel, Doyle, Grundy, & Mckee, 2009), ("WHO | Health systems strengthening," 2014). Attention is being given to e-health for diagnosis, therapy and entertainment of elderly people as seen, for example, in the Butler Project (Botella et al., 2009) or in a program on increasing the confidence of elderly people living autonomously named CAALYX (Rocha et al., 2013)

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