IJSRM
INTERNATIONAL JOURNAL OF SCIENCE AND RESEARCH METHODOLOGY
An Official Publication of Human Journals

Human Journals
Review Article
August 2020 Vol.:16, Issue:2

Technological Innovations Applied to Elderly Health

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INTERNATIONAL JOURNAL OF SCIENCE AND RESEARCH METHODOLOGY
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Submission: 25 July 2020
Accepted: 01 August 2020
Published: 30 August 2020

HUMAN JOURNALS
www.ijsrm.humanjournals.com

Keywords: Health Technology Assessment; Technology applied to health care; Elderly Health

ABSTRACT

Currently, some technological innovations applied to health are fundamental for the exponential increase in life expectancy. This study sought to analyze the acceptability, understanding and usability of technology applied to the health of the elderly. Digital technologies, as well as Information and Communication Technologies for the elderly, are very much in focus today, especially with regard to their ability to interact with such tools in the search for information. Based on this, the experiences that relate aging and digital inclusion have been taking place at all levels, especially in the digital environment. We conclude that the use of technology can favor the practice of motor activities favoring social and behavioral change in the elderly. Further studies are recommended that are able to list more precisely the variables that favor or not the use of technology on a daily basis.

INTRODUCTION

The 2010 demographic census numerically indicated that the Brazilian population currently corresponds to 190,755,199 million people, with 51%, the equivalent of 97 million, being women, and 49%, the equivalent of 93 million, being men. The number in relation to the elderly, is 20,590,599 million, that is, approximately 10.8% of the total population. Of these, 55.5% (11,434,487) are women and 44.5% (9,156,112) are men, it is important to note that, according to the National Elderly Policy (PNI) and the Elderly Statute, these individuals must be aged equal to 60 years or more, to be considered elderly in Brazil[1].

The phenomenon resulting from demographic and epidemiological changes among the elderly has caused a high population growth, implying the need to deepen in research that focuses better on this population and the problems to which they are exposed, such as the occurrence of falls, considered one of the main causes of morbidity and mortality due to external causes among the elderly[2].

Brazil has aged rapidly and its changes in population dynamics are evident, unequivocal and irreversible. Since 1940, there has been an increase in the population growth of the elderly. In the 50s, the growth rate of the elderly population reached values above 3% per year, reaching 3.4%, between 1991 and 2000. When comparing, between the 25 years interval (1980 to 2005), the growth of the elderly population in relation to the growth of the total population, it is observed that the growth of the elderly population was 126.3%, while the growth of the total population was only 55.3%. In the same interval, the 80-year-old segment grew at a relatively higher rate than the total elderly population, showing a growth of 246.0%. In 2012, the age group of 80 years was composed of 2,935,585 people, representing 14% of the elderly Brazilian population[1].

In studies by Ferreira and Silva (2014)[3] the epidemiological data on population growth of the elderly are compared with data on growth of individuals who access or use the internet and social networks in addition to new technologies with smartphone devices, showing a considerable increase in terms of to the years 2009 and 2010, representing 10%. It is also emphasized that users on the internet, regarding the age group, have been changing, users over 50 years went from 10.3% in 2005 to 14.9% in 2010. Therefore, as stated by Sales (2014)[4], individuals of older age and the elderly, despite being seen as fragile people, are interested in participating effectively in the evolution of the technological world.

The areas of activity that focus on Health and Education are instigated to prepare professionals for performance and health promotion in the environments in which the elderly are and in situations that require educational work for human development in the construction of projects directed to the community[5]. Educating and learning for the elderly becomes a significant process, as these individuals show themselves capable of resisting the battles and cognitive difficulties that their own age presents[6,7]. This study sought to analyze, through a literature review, the acceptability, understanding and usability of technology applied to the health of the elderly.

MATERIAL AND METHOD

It is a literature review article, developed through a bibliographic survey in the Medline, PubMed and Science direct databases. The search strategy used were "Health Technology Assessment", "Technology applied to health care", "Health of the Elderly", "Health Technology Assessment", "Technology applied to health care", “Elderly Health". Thirteen articles published between 2003 and 2019 were selected, included based on the following inclusion criteria: availability of the full text, publication in Portuguese, English and Spanish and clarity in the methodological details used. In addition, articles cited by more than one author were also sought to serve as a more accurate and complete reference for the review. The abstracts were read and evaluated by the authors and categorized as relevant or not to the topic according to the inclusion criteria previously elucidated.

RESULTS AND DISCUSSION

Physiological, emotional and psychological aspects of aging

Physiological aging comprises a series of changes in organic functions due exclusively to the effects of advanced age on the organism, causing it to lose its ability to maintain homeostatic balance and all physiological functions to gradually begin to decline[8]. The physiological changes intrinsic to aging are subtle, unable to generate any disability in the initial phase, although, over the years, they will cause increasing levels of limitations to the performance of basic activities of daily living[9].

Figure 1, adapted from the study by Ferreira and Silva (2014)[3], lists some conditions inherent to the aging process with regard to age, chronological, biological, psychological, functional and social, as the elderly go through all these conditions of different and individualized way.

It is noticed that the conditions of aging limitations can negatively interfere with the functional activities of the elderly's daily life and that physiological and psychological data should not be considered separately, as they are mutually imposed. With regard to the use of technologies, the focus of this study, technological diversity faces the physical, psychological and emotional limitations of the elderly that can result in barriers between the elderly and modernity[8].

AGING PROCESS	
Chronological age	Refers to the number of years that elapse from the birth of a person to the date in question.
Biological age	Considered as the estimate of the individual's position in relation to their life potential (biological health index).
Psychological Age	It concerns the skills of an individual to adapt to environmental changes (learning, memory, intelligence, emotional control, strength of motivation) comparing it with other individuals of the same chronological age.
Functional Age	A measure of a person's ability to function effectively in a particular environment or society.
Social Age	It stems from the social roles and expectations that people have about them and those imposed by society.

Figure No. 1: Aging process: Chronological, biological, psychological and functional age of the elderly.

Source: Ferreira and Silva (2014).

Motor activities for the elderly in the prevention of disease risks

Atividade física como qualquer movimento corporal, produzido pelos músculos esqueléticos, que resulta em gasto energético maior do que os níveis de repouso, por exemplo, como: caminhada, dança, jardinagem, subir escadas, dentre outras atividades, o exercício físico como toda atividade física planejada, estruturada e repetitiva que tem como objetivo a melhoria e a manutenção de um ou mais componentes da aptidão física. Sendo assim, deve-se estimular a população idosa à prática de atividades físicas capazes de promover a melhoria da

aptidão física relacionada à saúde. Segundo estudos epidemiológicos, a prática das atividades físicas proporciona benefícios nas áreas psicofisiológicas[10].

Insertions of digital technologies for the elderly

Digital technologies, as well as Information and Communication Technologies for the elderly, are very much in focus today, especially with regard to their ability to interact with such tools in the search for information. Based on this, experiences that relate aging and digital inclusion have been taking place at all levels, especially in the digital environment. Although they are still rare, there are programs that offer computer courses for the elderly who tend to have a significant frequency in non-governmental institutions and in Universities Open to the Elderly. This access of the elderly population to the digital world favors the maintenance of their social roles, the exercise of citizenship, autonomy and direct action in a complex society, promoting the maintenance of a more active life. These initiatives have been causing the elderly to access digital social networks, websites and blogs more and more frequently[11].

A lei nº 10.741, de 1º de outubro de 2003, intitula da "Estatuto do idoso" em seu Capítulo V, art. 21. § 1º garante o direito a cursos especiais que incluirão conteúdo relativo às técnicas de comunicação, computação e demais avanços tecnológicos, para sua integração à vida moderna. Portanto o idoso deve ter acesso à internet, como um fator sócio inclusivo. O fator transformador e socializador para idoso incluído as comunicações reelabora conceitos recebidos e torna- o capaz de provocar mudanças e compartilhá-las. As novas tecnologias podem ser instrumentos úteis para a desconstrução dos mitos que limitam a velhice, pois o seu uso oferece aos idosos um sentimento de inserção na sociedade, possibilitando mudanças positivas na saúde mental, melhorando a auto estima, estimulando a memória de curto prazo e ainda possibilitando que o idoso encontre informações variadas voltadas para assuntos de seu interesse[3].

Santos (2017)[12] in his study concluded that the elderly use new technologies and virtual communication to exchange information via electronic mail service, as well as to do research, purchases, use banking services and participate in social networks and virtual forums. These programs that insert the elderly in this technological environment, make them arouse the will to learn to use these tools, but fear is a great villain in this elderly / technology process.

Karshar (2003)[13] infers that between the young and the old there are divergences of generations where the young man comes from a universe with icons, images, buttons, keys, and, for this reason, he has a better ability in the operationalization and resourcefulness of the use of these resources. The elderly, on the other hand, are part of a generation that lives with this advance that often turns into a conflict to accompany this rapid and complex growth that refers to technological changes.

CONCLUSIONS

It was concluded that the use of technology can favor the practice of motor activities favoring social and behavioral change in the elderly. Further studies are recommended that are able to list more precisely the variables that favor or not the use of technology on a daily basis. For, if it is possible to visualize the aspects that relate to difficulties and facilities, new strategic approaches can be established aiming at this elderly person to recognize that he needs to overcome existing barriers, whether physical or emotional, so that he can maintain himself connected in this world increasingly immersed in technology.

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