

Ethical Issues in the use of Exergames in the Elderly

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ABSTRACT

There has been a lot of recent literature in the use of exergames in the elderly. Exergames have been used in the management of various disorders in the elderly like gait and movement disorders, motility in general and in dementia and depression. There have been various controlled trials of these exergames in the elderly. While exergames is a digital interface intervention, there are various ethical issues that may arise in the use of exergames in the elderly. The current paper is attempting to elucidate the various ethical issues concerned with the study, use and introduction of exergames in the elderly.

Keywords: elderly, ethical, exergames, dementia, gait, movement.

Introduction

It is no secret that India's population is aging, in fact, India's geriatric population is predicted to increase by 41% by 2031 [1]. This means that there will be a shift toward elder care in the coming years to allow aging with dignity. Exergaming is a promising arena for research because it promotes healthy aging by positively impacting self-imaging and self-efficacy, improving physical skills and wellness, and encouraging social engagement [2]. However, a shift towards new health-related practices comes hand in hand with research and by extension the ethics involved in such research. The current paper looks at the various ethical issues that arise with the use of exergames in the elderly.

Informed Consent in the elderly

Informed consent is the backbone of all research; the ethics behind obtaining informed consent from the elderly is particularly nuanced because of the presence of several factors that impairs their ability to make informed decisions. For consent to be truly informed, the researchers should ensure that participants have received details about the research they are participating in its entirety and understood all the information being given to them [3]. However, greater age and lower levels of education are associated with a poorer understanding of informed consent [4]. In addition, visual and auditory decline associated with increasing age also adds to the difficulty in understanding [3]. In a country as vast and varied as India, language and cultural barriers can also lead to more issues and pose difficulties in truly grasping exactly what one is consenting to, this can be even more challenging when technical terms related to exergames and their mechanisms need to be communicated in regional languages.

The American Psychological Association (APA) advocates respect for people's rights and dignity and mentions that specific accommodations should be made for people whose vulnerabilities

impair autonomous decision-making [5]. This is of particular importance while working with cognitive impairment. Cognitive impairment can occur due to a variety of factors but among them, dementia is of particular importance because it is one of the most prevalent causes of disability in the geriatric population in India [6], a person dealing with declining cognitive abilities might not have the ability to understand and recall enough information about an unfamiliar topic to make an informed choice. Techniques for supporting and enhancing decision-making in the elderly about participation in exergames should be routinely used. Sometimes, an elderly individual might sign up for exergame-based research without fully comprehending what it entails, consent obtained after a try out or 'experienced consent' can be useful in these situations [7] since many geriatric individuals are not familiar with the technology used in exergames. Obtaining consent should be a process and not a singular event especially when the participant in question experiences fluctuations in their level of mental competence and awareness. The lack of standardization of such process can result in complications. In addition, elderly people living in institutions might agree to consent to exergame studies to get attention or approval from their caretakers. they might also agree because they are afraid they'll end up getting neglected or face hostility if they refuse [8].

Proxy consent provided by caregivers is often viewed as a viable alternative when the participant is unable to consent. However, factors such as caregiver distress, depression, and the nature of the relationship with the elderly participant can influence decision-making [9]. In environments where the participants are living with families and the primary responsibilities of the participants are dependent on a caregiver, consent should also be taken from them. The addition of an exergame into the daily life of the family means an additional source of responsibility for changing and maintaining the pieces of equipment as well as overseeing the participant while they are exercising to avoid any accidents from occurring. Therefore the family/caregiver should also be informed about the role changes and challenges they might face, there should also be a discussion about how to respond to and who to turn to, to take responsibility for the medical care or financial expenditure in case of the unlikely event of an injury sustained while engaging in exergaming and consent should be obtained from the all the family members who will be affected by the usage of the exergaming technology [10].

Privacy and Cyber-security

Another arena of ethical concerns is that of privacy and cyber security. Privacy can be defined as the 'right of an individual to keep information about themselves from being disclosed to others' [11]. Exergames that make use of tracking devices and motion sensing devices to keep tabs on their elderly patients can seriously violate all the dimensions of privacy. Privacy violations can occur when one's information is either obtained without permission or against one's will [12]. The logistics behind the storage of the personal data obtained over the course of the study should be carefully considered. If all of the personal information collected about the participants over the course of the study is stored in the form of electronic medical records or saved in cloud storage then the data is vulnerable to cyber security threats, confidentiality breaches, and unauthorized access [13]. The maximum protection of the data should be guaranteed by all individuals involved including medical staff, researchers, maintenance, and installation technicians [14].

Lack of control over what kind of information and extent of information is shared can be particularly dubious, especially with the involvement of third-party actors such as service providers, maintenance personnel and relatives [15]. Even the sharing of private information between relatives has the potential of changing the care dynamics between the participant and their caregivers [16].

It is often assumed that the geriatric participants will prefer conducting their exercising regime from the safety and comfort of their home, but this might not be true especially since home based exergames can make people feel observed and conscious about being judged by unauthorized personnel or they may also fear a breach in confidentiality due to cyber security issues, burglary or sharing of sensitive information that can leave them vulnerable to home invasion or other security threats. this can create a sense of alienation and insecurity in an area that should be

considered a safe space [17]. Furthermore, unfamiliarity with and poor understanding of the equipment and technology means that the elderly participant may experience continued anxiety about the privacy and well-being of their family members even when the necessary precautions are taken.

Too much responsibility on the participant

The availability of advanced psychotherapy, physiotherapy, and intervention strategies provided by home-based exergames raises questions of competence and places too much responsibility on the participants and their caregivers resulting in the creation of unclear responsibilities, particularly for the caregivers [18]. Limiting visits to hospitals and other health-focused institutions can inadvertently increase machine dependence and hamper the timely and accurate diagnosis and rectification of emerging conditions or health developments that might have been noticed during a routine visit to a mental or physical health practitioner. Studies that introduce exergaming as means of replacing traditional physiotherapy and group exercising also run the risk of cutting their participants from human contact as it reduces instances where the participants have a chance to interact with other individuals in the form of group exercising or walking in community areas or even meeting their physiotherapist or trainer [19].

Issues related to the technology

The technology utilized in exergames is often highly complex and sensitive and requires maintenance and upkeep. The elderly participant might not have the ability to keep up with the demands of such technologically advanced devices, this poses further challenges because either the participant or their caregiver needs to understand and keep up to date with charging or any other updates. Some elderly participants might feel trepidation about using the technology especially when the study makes use of virtual reality experience-based games where they have to wear headsets, joysticks, or wands. They might fear getting tangled up in the wires, electrocuting themselves, or accidentally breaking delicate equipment. The highly specialized and technologically advanced gadgets that are used during these studies can be expensive and are typically not covered through financial aid or insurance. Therefore, the participants might have to rely on their saved finances or receive help from relatives to be able to afford them unless the devices are provided by the organization carrying out the research study [20]. The use of exergames on a daily basis can result in habituation, a study found that some older individuals believe that they spent too much time playing digital games, to the point they experience minor physical ailments such as a sore neck due to the long hours they spent playing [21]. Game addiction at an advanced age can cause even more social isolation, furthermore, the nostalgia-inducing qualities of certain games that replicate real-life activities like bowling, skiing, or gardening, can cause a sense of sadness and loss in the elderly individuals who find themselves homebound or sequestered in institutions.

The headsets used in virtual reality or augmented reality exergames can cause cybersickness which can include disorientation, nausea, headaches, put strain on the eyes, cause retina damage and dryness in the eyes [22], these can evolve into secondary conditions in a vulnerable population like that of the elderly [23]. Problems with controllers and finicky equipment can cause frustration in the elderly playing in the home setting and embarrassment in the group exergaming setting. Studies with virtual reality should be undertaken with extreme caution especially when the elderly participants in question suffer from co-morbid psychological conditions. A 2018 study found that a virtual reality-based game had a positive effect on people with dementia, however, it was also found that participants with dementia experienced more fear and anxiety than the normative group [24].

Aftermath of the study

Discussions about what happens once the study reaches its conclusion become important. Will the elderly participants be allowed access to the technology and devices after the study has run its course? In the case of home-based exergaming research, the fate of the equipment installed at homes is also a point of discussion. The devices may both be uninstalled and removed, or the

family may be allowed to retain them and continue with the exercise regimen the elderly participant has gotten used to, does this mean they will need to pay for the equipment and its upkeep? In case they are unable to will a physiotherapist and a psychotherapist be allocated to them to ensure that there is no loss in the physical and cognitive developments that occurred during the study? This also raises issues about just distribution of exergame technology, if only the people who can afford to eventually buy and maintain these devices are given access to them then it contributes to the digital divide and denies people from families with lower income access to technology, Socio-economic factors language and technological literacy of both the participants and their caregivers can also act as an important factor that can limit access to exergame technology that could have improved their quality of life and ultimately enhance other disparities [25].

The utilization of exergames with the elderly is a relatively recent domain of study, therefore it is absolutely imperative for the researchers to ensure that the study goes ahead only when the possible risks have been competently calculated and strategies to manage them have been proficiently implemented [26].

Digital Addiction in the Elderly

The use of exergames in the elderly may lead to some of them getting psychologically dependent on these games as a part of their daily routine and later withdrawing the same after a span of time may get difficult. There are enough studies to show that behavioral and digital addictions are common in the elderly. In India, many elders are lonely and do not have schedule for the day, so the exergames may be a source of entertainment and a means to eliminate loneliness and boredom. This is an important facet that must be kept in mind when introducing exergames to the elderly [27].

Conclusions and Future Implications

Thus, there are many complications of the use of exergames in the elderly and there may be many reasons why ethical factors must be kept in mind when introducing these games as a treatment modality and in controlled trials of the same in the elderly. There is a need for researchers, practitioners in gerontology, physiotherapy and geriatric mental health to be aware of the same and keep in mind various factors when using this treatment modality.

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