Autonomy and Dignity for Elderly Using Socially Assistive Technologies

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***Abstract*—In the domain of technology design for elderly care homes, striking a balance between patient autonomy, individual needs, and physical care is imperative. As technology advances, it becomes crucial to prioritize the preservation of patients' autonomy and dignity while addressing their specific needs for physical care. This abstract explores the intricate ethical issues surrounding the utilization of social robots and conversational agents in this context, shedding light on the potential consequences of neglecting patient autonomy and disregarding their needs. By delving into the implications of these ethical challenges, we propose strategies tailored to elderly care, drawing from existing literature to navigate these complexities effectively.**

***Index Terms*—Ethics, ethical care, elderly care, social robots**

I. Introduction

In the design of technology for elderly care homes, it is imperative to navigate the ethical considerations surrounding patient autonomy, needs, and physical care. As technology advances, it is crucial to prioritize the preservation of patients' autonomy and dignity while addressing their specific needs for physical care. We delve into the ethical issues encompassing these factors when using socially assistive technologies, explore the implications of neglecting patient autonomy, and the potential harms associated with disregarding patient needs in the design of the technology. By considering the specific dimensions added by the elderly care home setting and drawing upon existing guidance in the literature, we propose strategies to address these ethical challenges and ensure the well-being and dignity of elderly residents.

II. Ethical background

Social Assistive Robots (SARs) encompass a wide range of interactive modalities, including facial expressions, speech, gestures, and behavior. Specifically tailored for voice interaction with older adults and individuals with impairments, this technology falls into two main categories: social robots and virtual AI assistants. The former category serves four primary roles in companionship, health monitoring, cognitive stimulation, and clinical therapy [1], the latter includes conversational agents that build upon the dialogue capabilities found in Google Actions and Amazon Alexa [2], [3]. Personalized solutions have been developed using machine learning [4], [5].

The utilization of SARs introduces ethical concerns in areas such as privacy, deception, the development of emotional attachments, and autonomy [6]. To address these ethical dilemmas, it is crucial to explore design trends, human-robot trials, and interventions, and consider cultural and language adaptation. Additionally, adherence to standards like BS 8611 [7] is essential to minimize the risk of unnecessary anthropomorphism and deception in SARs while maintaining transparency about their robotic nature [8].

III. Understanding dignity and autonomy

A significant concern in the context of socially assistive technologies used for elderly care pertains to their potential impact on the user's autonomy and dignity. The "intersubjective" nature of interaction with SARs introduces privacy risks, while the provision of excessive assistance may lead to a loss of user independence, giving rise to concerns about emerging vulnerabilities [9]. Moreover, as robots gain greater autonomy, there is a growing risk that their decisions may clash with human values and preferences. While care robots have the potential to enhance autonomy by assisting with various tasks and promoting self-sufficiency, such as medication reminders and mobility support, they can also inadvertently encroach upon autonomy [10], [11], [12]. Excessive intrusiveness or overly restrictive decision-making algorithms can curtail residents' choices and decision-making abilities, eroding their sense of independence and individual agency [12]. This can manifest as a disclosure of sensitive information to agents that may be collecting such data, as well as an excessive dependence on this technology for crucial tasks like setting reminders, scheduling appointments, and providing companionship.

IV. Ethical implications of human-machine interaction

To implement fair practices for executing user requests, it is crucial for the robot interface to be fully transparent about the robot's capabilities and limitations, minimizing deception. Deception refers to intentional misleading or misrepresenting of information by the robot to the user or others involved in the care process. The robot could provide false or inaccurate information, manipulate perceptions, or conceal certain facts or capabilities. Although conversational agents can impart a positive impact on perception and mood, as in the CA described in [13], there is a concern surrounding the potential for robots to engage in deception by presenting themselves as human-like or by providing false information to users [9].

Envision a care facility incorporating a humanoid robot to aid residents in their daily routines. Among these residents,

Mary stands out due to her moderate cognitive impairment and frequent bouts of loneliness. Her bond with the robot has grown remarkably strong, and she fondly refers to it as "Robbie." The resulting consequences have the potential to give rise to misunderstandings and a sense of being deceived. To address potential deception, care robots must be transparent about their capabilities and limitations and should be designed to clearly communicate with patients that they are not human caregivers, but instead are assistive tools that can provide support in certain areas [14]. By fostering transparency and clear communication between residents like Mary and care robots like Robbie, we can ensure that these valuable assistive tools enhance the lives of elderly individuals while maintaining trust and ethical care standards in the caregiving environment.

V. Public perception and awareness

It is crucial to consider the potential impact of technology on individuals who are particularly vulnerable to and may feel trapped by feelings of alienation and loss of autonomy. This is especially salient in assisted living or memory care environments [15]. The inherent worry and reliance on others for basic needs require design elements that ensure there are adequate safeguards in place to address the patients' needs effectively while maintaining their autonomy [16]. Common hurdles to the adoption of any new technology include physical challenges, skepticism, difficulties in learning new technology, and general fears of autonomy loss, especially in the context of increasing needs for assistance [16]. Older adults, who are often less affluent, tend to have these beliefs associated with the introduction of new technology [16].

Among adults aged 65 years and older, a significant proportion reports having disabilities [17]. Given this large population, it is essential to calibrate the level of assistance accordingly [18]. Clear communication channel alternatives should be established to ensure that a resident is able to be properly understood, especially if they have conditions like a stutter. There should also be ways for conveying when the assistance required exceeds the capabilities of the robot and additional human assistance is needed, striking a balance of assistance and individual's sense of autonomy [18], [19].

Furthermore, individuals with limited exposure to technology often harbor concerns about losing autonomy [20]. Common reasons for hesitancy towards new technology include a lack of instructions or guidance, insufficient knowledge and confidence, feelings of inadequacy, and limited social interaction and communication [20]. To address this, design solutions should focus on supporting autonomy rather than supplanting it. Autonomy is a vital aspect that preserves individual dignity and has the potential to enhance morale and life satisfaction [19]. Thereby, to nurture feelings of empowerment and autonomy, attention should be placed on increased documentation accessibility and robot transparency/communication.

To overcome these barriers, our proposed solution emphasizes "empowering design", where social robots support patient autonomy and socialization through accessible and inclusive design. Social robots have the potential for greater engagement and social support [21]. They can retain decision-making autonomy and provide clearer instructions, education, and knowledge about medications, thereby also promoting medication adherence [22].

VI. Design Principles

To effectively mitigate apprehensions users might harbor concerning autonomy and dignity, design principles have to center on ways in which functionalities can augment, rather than entirely replace, a user's capacity to decide and exert optimal authority. This requires a profound grasp of the diverse limitations individual users might contend with, all while fostering an inclusive design that encompasses user interface elements aimed at minimizing obstacles to the robot's utilization for those with physical or mental handicaps. Flexibility in the level of assistance provided is needed to ensure that it neither imposes excessive support nor neglects individual needs. It is critical to empower individuals to exercise their authority and make choices by allowing them to indicate when they want to perform a task themselves.

As recommended by Fronemann [23], we advocate for the application of user interface design principles tailored to older adults, with specific emphasis on simplicity and intuitiveness. To alleviate the cognitive burden, the complexity of interfaces has to facilitate information updates through techniques such as visualization, repetition, and a cohesive design language. The interface should prioritize a curated set of options, integrate unhurried transitions, and abstract information through judicious use of colors and shapes, minimizing reliance on textual elements.

The integration of tactile interfaces is gaining prominence in light of findings by Findlater et al. [24], suggesting that touch screens are inherently more user-friendly for older adults. Strategic adaptations must be made to accommodate sensory and motor limitations, encompassing elements like enlarged buttons, restricted color contrasts, and calibrated control responsiveness. It is also crucial to introduce ways for users to exercise greater control.

Personalization of support and services can be based on prior knowledge garnered about each individual or collected via online machine learning methods.

VII. Conclusions

In conclusion, the confluence of technology and elderly care requires a conscientious approach that places patient autonomy, dignity, and well-being at the forefront. The ethical considerations we outlined underscore the imperative of ethically grounded design principles for technology used in elderly care homes. As the population ages and reliance on technology grows, it becomes increasingly vital to navigate the complexities of human-robot interaction while preserving the inherent rights and agency of elderly residents. By engaging with the multifaceted dimensions of autonomy and dignity, we unveil the potential pitfalls of overstepping boundaries, inadvertently curtailing residents' choices, or fostering dependence.

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