

Humanoid Robots: Useful Tools or an Illusion?

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Dementia encompasses a group of disorders that have a profound social and healthcare impact, requiring a well-coordinated network of health and social care services. It remains one of the leading causes of disability among older adults worldwide.

The management of the behavioral and psychological symptoms of dementia (BPSD) is one of the greatest challenges facing contemporary healthcare systems. Against the backdrop of a chronic shortage of healthcare professionals, socially assistive robots (SARs) with human-like features have emerged as a promising technological solution for providing emotional support and cognitive stimulation (Moyle et al., 2020).

Among these, Pepper—a 120-cm-tall humanoid robot equipped with a chest-mounted tablet and wheeled mobility—has become one of the most widely adopted platforms for interpersonal interaction in memory care settings. Capable of recognizing facial expressions and adapting its behaviour accordingly, Pepper is increasingly used to deliver cognitive exercises, administer screening tools such as the Mini-Mental State Examination (MMSE), and help reduce patient anxiety. Nevertheless, introducing anthropomorphic machines into highly

vulnerable settings such as residential dementia care facilities raises urgent ethical and clinical questions: are we truly providing appropriate care for the patient?

Clinical and Ethical Challenges

From a clinical perspective, the short-term effectiveness of platforms such as Pepper is well documented. Unlike human caregivers, robots do not experience fatigue or burnout, can interact with unlimited patience, and often encourage playful engagement and emotional expression among older adults.

The central ethical concern, however, relates to informed consent and the phenomenon of therapeutic deception. Every person receiving care has the right to receive information in a manner they can understand in order to make informed decisions. When an individual lacks decision-making capacity, consent should be provided by a legally appointed guardian or support administrator; where such a representative is unavailable, consent may be obtained from a close family member or informal caregiver.

Older adults with moderate or severe dementia

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frequently lack the cognitive capacity to distinguish a machine driven by algorithms from a sentient being (Vandemeulebroucke et al., 2020). Encouraging the belief that Pepper experiences genuine empathy or is a real "companion" raises profound moral concerns regarding respect for the dignity and autonomy of people living with dementia (Sharkey & Sharkey, 2021).

Humanity is expressed through acting for others: the moral value of human actions lies in the intentions that motivate them. When nurses provide care, they understand both why they are acting and for whom. Effective nursing care begins with assessing each person's needs and actively involving them in identifying problems and planning care and supportive interventions.

The studies reviewed also raise concerns regarding users' perceptions. Although many older adults perceive Pepper's rounded, child-like appearance as reassuring, the mismatch between its human-like appearance and its imperfect verbal responses may trigger the uncanny valley effect. In 1970, roboticist Masahiro Mori described how robots that closely resemble humans, yet display subtle imperfections in movement or facial expression, can evoke feelings of discomfort, anxiety, or even fear. Rather than providing reassurance, these reactions may diminish any therapeutic benefit and potentially exacerbate anxiety and other negative emotional states in people with dementia.

Qualitative studies involving family caregivers have also revealed concerns that the adoption of humanoid robots could be driven primarily by efforts to reduce staffing costs, ultimately increasing the social isolation of people with dementia by replacing genuine human relationships with technological substitutes.

Future Perspectives

To prevent humanoid robotics from becoming a source of alienation, future research should redefine its role within clinical practice. Robots such as Pepper have the potential to facilitate communication between older adults, their families, and nursing staff; however, they should never be regarded as substitutes for genuine human affection and interpersonal relationships.

Research on intelligent assistive technologies has highlighted the importance of developing robotic responses using validated clinical

databases, thereby reducing the risk of delivering inappropriate or potentially distressing stimuli to individuals living with dementia (Tan et al., 2026).

Furthermore, robots designed to support cognitive stimulation programs should be developed through close collaboration among bioethicists, caregiver organizations, physicians, nurses, and other professionals specializing in dementia care.

Conclusions

Humanoid robots have considerable potential as complementary therapeutic tools in dementia care. Their success, however, should not be judged by how convincingly they imitate human beings, but by their ability to enhance cognitive stimulation, motor rehabilitation, and social engagement while preserving the dignity of the individual.

Robots with human-like features can support communication and care for older adults with dementia, provided that careful attention is paid to the associated ethical and legal challenges, including privacy protection, responsible management of personal data, and the requirement for genuine informed consent from patients or their legally authorized representatives.

The scientific community and research ethics committees must advocate for a robust regulatory framework governing the use of artificial intelligence in dementia care. Artificial intelligence can support healthcare delivery, but empathy remains an exclusively human attribute. Preserving this distinction is essential if technology is to complement rather than replace relational care, and to ensure that robotics does not become an attractive shortcut for reducing staffing costs or avoiding the moral responsibility of caring for vulnerable older adults.

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