Discussion of Nursing Robot's Capability and Ethical Issues

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Abstract

This paper discusses ethical issues regarding nursing robots’ provision of care services to patients. In the care of patients, an assistive-nursing-robot would need to establish desirable relationships with persons, to notice slight changes in their expressions and tone of voice, to understand their feelings, to utilize obtained information, and act based upon this information. When such robots are actually adopted in clinical practice, it may be essential to clarify actual ethical issues from a nursing viewpoint. It is an important issue in nursing practice to recognize and live with advanced science, while enhancing discussions about its effective utilization particularly with engineering counterparts.

Key Words: Nursing robot, Capability, Caring, Ethical issue

1. Introduction

In Japan, significant progress has been made in engineering research on the practical use of medical and rehabilitation robots in assistive-care [1]. On some occasions, they are adopted to meet medical care and welfare needs, such as making up for insufficient nursing staff and promoting medical and other health care services. However, the functions of these robots have not yet been clearly defined. Their design and development are critical to efficient and safe utilization in collaboration with professional nurses and other health-care personnel. It is vital for engineering and nursing scientists to start essential conversations regarding areas of knowledge and collaborative engagement which are pertinent to nursing. Moreover, considering that it is difficult to adopt these robots in clinical practice without specifying their functions, appropriate methods to manage their clinical performance have yet to be fully examined from a nursing viewpoint. This paper discusses ethical issues regarding nursing robots’ provision of care services to patients.
2. Capability required for a nursing robot

Professional nursing is generally expressed as practice, education, and research. Four constructs advance this understanding: nursing, person, health and environment. When entering into a human-care situation the nurse focuses on coming to know the other as a caring person, and understanding how that person is living uniquely in relationship with another. As such, nursing becomes an indispensable professional practice that is integral to attaining and maintaining human health and human care.

Within this professional nursing are the needed skills that enhance the sympathetic understanding of patients focusing on long-term care effects [2]. Caring may be understood as nurses empathetically placing themselves in the positions of others to understand who they are as persons with thoughts and feelings, while creating comfortable environments for them, listening attentively, responding to what matters to them, and talking gently to them. Therefore, such practice engagement when influenced by technologies of care must be collaborative and relating, while demanding that the nurse practice as a caring person.

Is caring essential in the development of an assistive-care robot for nurses? What abilities do nurses expect of a robot assistant which may assume duties of care at any given point in time?

Considering that robotic surgery and rehabilitation medical practice have already adopted robots as crucial to their success, nursing robots are also likely to be adopted in the very near future [3]. In a prior study examining the effects of medical/welfare robots on hospital services, robots were shown to efficiently facilitate drug preparation and delivery. In nursing practice, robots were reported to save delivery time for drugs particularly in emergency cases and during the night shift [4].

Nursing robots may come in different forms based on the purpose and context in which they are deployed. They could be “support robot” [5] that helps people move, or “rehabilitation robot” [6] that provides passive range-of-motion exercises. Regardless which types of robots are deployed in the caring environments, there are certain questions need to answer, and aspects need to consider. For example functionalities, classification of conversations senses of a caring robot, and robot’s ability to convey empathy [7].

However, when an assistive-care robot, programmed with various competencies for care
interacts with patients and family members, it will become involved in their lives. Its behavior may offend or please them. In collaborating with nurses in the care of patients, an assistive-care robot would need to establish desirable relationships with persons, to notice slight changes in their expressions and tone of voice, to understand their feelings, to utilize obtained information, and act based upon this information. Human beings learn and develop these ‘caring’ skills while living in society. While interactive robots would learn new skills as they continue to be used, their memory banks could simply be updated or upgraded as new knowledge about human health and human caring and in particular, caring in nursing is ‘experienced’. Although databases for various competencies regarded as caring have been designed and developed for assistive-care robots, as an engineering technology, no effective system has yet been completed [8].

3. Ethical issues

Unlike the case of industrial robots, the development of robots in the medical and welfare fields should focus on concerns about maintaining humanity within the care environment. The changes in medical environments have not been noticeable impediments for the majority of nurses and nursing practice, except for those who are particularly interested in this issue.

Unfortunately, it seems few nurses may be aware of the actual situation of medical/welfare robot development at this time. As a future intermediary between care-receivers (patients) and biotechnology, medical engineering, and robotics, it may be necessary to discuss the development of nursing robots and the consequent ethical issues in their clinical application. Furthermore, when such robots are actually adopted in clinical practice, it may be essential to clarify actual ethical problems from a nursing viewpoint.

Lin et al. [9] said “It seems almost paradoxical that the more safety the robots provide, the more their use may breach human rights”. Robot ‘care’ givers have a possibility of infringing on an individual’s rights and privacy, importantly, robots cannot be completely said to be safe. The future of care-robotics may indicate the possibility that automated care could dramatically reduce the amount of human contact needed for safety and physical welfare, thus influencing its technological caring value [10]. The Robot Ethics Charter was drawn up by the Ministry of Commerce, Industry, and Energy of South Korea to establish ethical guidelines for developers, users, and for robots [11], while Chiba University enacted the Chiba University Charter regarding intelligent robot technology education and research, mentioning the necessity of incorporating technologies to prevent the unethical or illegal use of robots [12].

In contrast, contemporary ethical issues in the clinical application of nursing robots have
rarely been discussed. Unlike nurses, nursing robots are not licensed and the following questions remain unclear: What are the methods that can be used to ensure nursing robots’ abilities to care for humans? Is it appropriate for robots to touch humans? What methods can be used to avoid the dangerous effects of their unsafe and uncontrollable performance? What methods can be used to program these robots to “behave ethically”?

As patients’ conditions continuously change, it is necessary for nurses to make the most appropriate decision in an individual situation, and the question whether nursing robots will be able to play such a role should be examined from ethical viewpoints.

4. Conclusion

When assistive-care robots for nurses are introduced into clinical settings, how would they collaborate with nurses and with other interdisciplinary personnel? To collaborate with humans, robots are required to not only move in a cooperative manner, but also to have skills for one-on-one and group communication [13]. Should an assistive-care robot be used as an assistant to a nurse, or should it work independently? Working independently would require sophisticated technology that would possibly eliminate the need for human nursing care, leaving patients entirely to the ministrations of machine technology, in whichever form it would take. The programmed features of an assistive-care robot shape the manner in which it will communicate and collaborate with nurses and other health-care personnel.

The development of medical/welfare robots is not necessarily harmful rather it can be promoted since its use in providing health care services are very beneficial to people with disabilities and incurable diseases. Advanced equipment and medical/welfare robots have been adopted before our interest in them sufficiently advanced. It is an important issue in nursing practice to recognize and live with advanced science, while enhancing discussions about its effective utilization particularly with engineering counterparts.

References


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