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Integrating Socially Assistive Robots into Japanese Nursing Care

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Abstract. This paper presents experiences of integrating assistive robots in Japanese nursing care through semi-structured interviews and site observations at three nursing homes in Japan during the spring of 2019. The study looked at experiences with the robots *Paro*, *Pepper*, and *Qoobo*. The goal was to investigate and evaluate the current state of using robots in the nursing care context, firsthand experiences with intended and real use, as well as response from the elderly and nursing staff. The qualitative analysis results pointed out user satisfaction, adjusted purpose, therapeutic and entertaining effects. Potentials of robots to assist in elderly care is advantageous. Limitations currently relate to the lack of ways to fully utilized and integrate robots.

Keywords. Assistive Robots, Nursing Care, Human-Robot Interaction (HRI), Therapy, Communication, Impact on Care.

1. Introduction

According to the United Nations (UN) demographic statistics, Japan's population has decreased since 2009. Japan's population today (2019) is about 126,800,000, but the forecast is that the number will fall to 108,800,000 by 2050 [1]. Moreover, Japan currently holds the world's largest population of elderly per capita with about 27% of Japan's population being 65 years or older. In order to cope with the changing demographic, possible solutions are to decrease the need for more human workers through innovation and to keep the elderly as independent as possible for longer.

The Japanese government has presented six priority areas where robot technology is to be introduced in nursing care, one of them being *monitoring and communication systems* [2]. We visited three different Japanese nursing facilities in order to see how robots are being used, what impact they made on the nursing care, and what positive and negative experiences the elderly and staff could share. The interviews focused on communication robots, being one of the newest items introduced as the government's priority areas whose development has been supported since 2017.

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2. Methods

The three nursing facilities were chosen as the study sites from a public list of nursing facilities using the robot *Paro* [3]. The interviews were not limited to *Paro* exclusively, but rather aimed at acquiring information on all interactive robots used at each facility (*Paro* was used at all 3 facilities, *Pepper* at two, and *Qoobo* at one). The interviews were primarily held with the facilities' managers and nursing staff in addition to observations of patients interacting with robots. The interviews were analyzed using open coding.

3. Results

The interviews suggested that these kinds of robots all work with the mind and the mental wellbeing of the patients. Patients suffering with dementia often believe *Paro* to be a dog or even a human baby, treating and interacting with it accordingly. Patients often cared and worried for *Paro*, thus indicating an emotional relationship. Interacting with *Paro* evoked memories about their childhood dog or child nursing days. *Paro* was found effective on both male and female patients if they liked animals, but patients that are more cognitively capable might find *Paro* less interesting. The use of robots has also depended on the nursing staff attitude. *Pepper* is used for recreation, entertaining patients through games and karaoke. Still, some patients found it loud and annoying. *Qoobo* was mostly used by one patient not interested in people but happy with the robot.

Discussion

Robots can be superior to the use of dolls or animals as therapeutic aids should be safe and have demonstratable therapeutic effects. Robots like *Paro* can work as an alternative to pet/animal therapy without the risk of allergy, bites, scratches, unpredictability, infections or even stress for the animal itself. However, some people dislike certain animals which makes them skeptical to animal-type robots as well. *Pepper* is mostly used to entertain, in addition to Taiso, the daily Japanese stretching exercise. However, the need for human workers is not eliminated. Ultimately, these robots are used to assist and relieve the humans from work overload. Patients, that usually did not smile to the human staff, were seen smiling and talking to the robots. Additional positive effects were increased interest of groups and often grandchildren to visit the nursing homes.

Conclusion

Positive effects were patient satisfaction, joy, and mood changes. On the downside, robots are not fully independent and demand staff attention which limits their use.

References

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