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Conference Abstract

The telepresence robot for social participation: how much assistance is required?

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Abstract

Purpose: The telepresence robot is a technology used for communication among people in remote places. This technology has the potential for increasing social participation of people who have motor impairments such as Spinal Cord Injury. For growing and diffusing telepresence robot, it is important to analyze the outcomes from the use of this technology in a practical situation. In this paper, in order to preliminary evaluate the economic aspect of the use of telepresence robot, we examined required assistance and its working hours.

Background: In a previous study, 3 research participants who have motor impairments (2 Spinal Cord Injury, 1 Arnold-Chiari malformation) were asked to use a telepresence robot and to attend university courses. During those experiments, the Italian version of Short Form Health Survey (SF36v2) was submitted to measure the benefit of this technology. The collected preliminary data don't have any statistical relevance, but are very useful information for these first steps of the research. For example it was observed that SF36 "Role physical" subscale score, which represents participants' perception to their social participation, was improved during the period of using robot and attending university course, relative to the period without using it[1].

Methods: 3 participants drove the telepresence robot “Double” (from Double robotics, Inc.), which was located in the university, from their home or hospital for a month. Each participants attended 2-hours lessons for 6-7 times during the experimental period. The required assistance for each one of participants to attend courses during experiment was examined. The first one was assistance from caregivers or nurses to participants for using computer and writing utensils at their home or hospital. The second one was assistance from university staff to robot, such as charging its battery and accompany along the way from its parking to classrooms. The last one was attention from teachers to “robot students” regarding lessons.

Results and Discussion: Regarding the assistance from caregivers or nurses, 2 participants drove robot and attend lessons without any support for neither preparation, nor using computer, nor writing utensils. On the other hand, one participant required support for preparation of laptop computer and using writing utensils due to his limited hand function. As a result, a nurse needed to stay with him during the use of robot (in total 120-150 min). Regarding the support to the robot, since the Double robot cannot climb up stairs, a university staff needed to accompany and carry it up/down the stairs along the way to and from the classrooms (in total 20-30 min) Regarding the attention from teachers, they occasionally sent teaching materials to participants by e-mail before lessons. During lessons, teachers did not need to take care about robots, and they treated “robot students” same as other students.

Keywords

telepresence; social participation; user case study; assistive technology

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References

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