A Simulator Robot Reproducing Patient's Variability for Nursing Students to Learn Transfer Skill

Recently, with aged society and diversified diseases, nurses are required for high proficiency and an ability to handle various patients. However, the present education is difficult to reach such need due to the difficulty to access various patients as in hospital. To improve the patient transfer skill of nursing education students, we developed a robot patient that can simulate three categories of patients: patients whose movements are affected by paralysis, patients whose movements are sensitive to pain with painful expression, and patients whose movements are constrained by medical devices. The students are expected to learn the skills required for interacting with various patients by practicing with the robot that imitate different patients.

To simulate trunk movements, novel waist and hip joints with hardware-inherent compliance and force sensing capability were proposed. In addition, control methods of these three categories of patient were developed and the parameters were tuned based on actual patient videos. To evaluate the developed robot, the experiment with nursing teacher was conducted firstly to obtain the validity of robot. The nursing teachers performed trials of transferring the robot patient as they would transfer an actual patient. The nursing teachers scored the robot patients based on a checklist. Moreover, subjective evaluations of a questionnaire were performed by the nursing teachers. The results showed that the nursing teachers performed most of the required skills of the checklist and agreed regarding the learning effectiveness of the robot. They recommended training nursing students using the robot patient in the questionnaire.

Keywords: Robot patient, Nursing education, Skill acquisition, Paralysis simulation, Various type of patients

Reference

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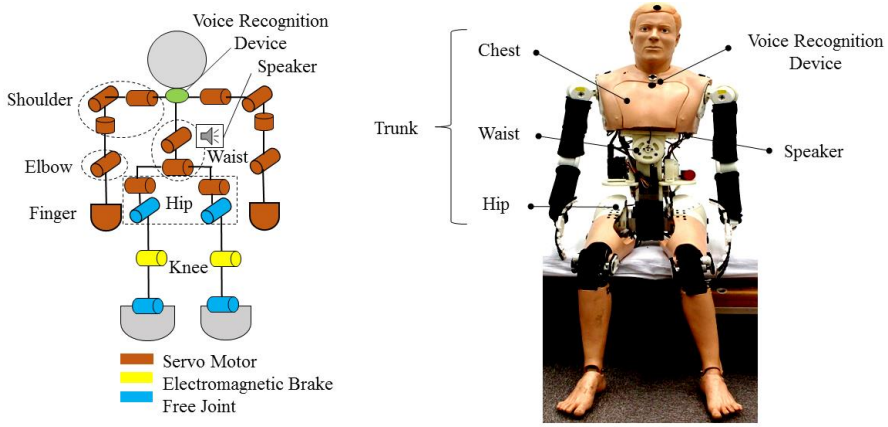

(a) (b)

Fig 1. Developed robot patient (a) joint configuration and (b) appearance.