

# Nursing intervention with patients undergoing rehabilitation using a robot suit, HAL®

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Received 20 October 2016; received in received from 22 March 2017; accepted 24 March 2017

## Abstract

We interviewed two patients undergoing rehabilitation using a robot suit, Hybrid Assistive Limb (HAL) ® to determine the feelings of the patients. As a result of having classified the answers, the four following labels were extracted, 1) physical effect and course by the disease or accident, 2) hospitalization life, 3) Evaluation of HAL, and 4) life after discharge. We were able to discover the needs of the patients as regards life in hospital by this study. This was useful in planning support for hospital nursing interventions and discharge.

**Keywords:** a robot suit, HAL, rehabilitation, interview

## Introduction

In Tokushima National Hospital, we conduct rehabilitation using the robot suit, Hybrid Assistive Limb (HAL) with patients having disorders of the lower limbs with multiple sclerosis, spinal cord injury, and quadriplegia. Takeshita et al. describe it as follows. Even if the HAL is disliked by the patients at first, they gradually feel it is useful. It is necessary for the nurse to understand this [1]. However, the nurse cannot snuggle up to the thought to the patients in the Tokushima National Hospital and do not know the needs of the patients now. Therefore, we interviewed a feeling for the hospitalization life for the patients of the second after hospitalization. We focused on information about the change of everyday life after the initial discharge.

## Subjects and methods

The subjects were two patients who had undergone a second hospitalization for rehabilitation with the HAL. We used the interview guide that was made originally by us. (1) The change in impression of the rehabilitation using the HAL, (2) Changes in everyday life from the last discharge to the present, (3) The request to a nurse. A researcher received a semi-constitutive interview. In each case, the interview was

carried out in a private room where privacy could be ensured. We recorded the interview using an IC recorder after having obtained the subject's consent and made a word for word record. We extracted a cord from an analysis methods made word for word record. The ethical considerations included providing information on: 1) The purpose of the study and methods, 2) The participation in the study, 3) Protection of personal information, 4) The fact that patients would not suffer any disadvantage from not participating in the study, 5) the consent of the study cooperation is free will of the people, 6) The interview contents would be recorded and would be used only for this study, 7) Patients were free to cease participation at any time. The interview was carried out by two researchers and one subject in a quiet private room. The interview time was around 30 minutes. Only one researcher handled the record produced by the IC recorder. The contents were deleted after the study.

## Results

The subjects were two patients. Patient 1 was a 53-year-old woman, and the length of stay was 57 days. Patient 2 was a 49-year-old woman, and the length of stay was 105 days. As a result of the interview, 54 cords were extracted from Patient 1 and 97 cords were

extracted from Patient 2. When we classified the answers into categories, the four following labels were extracted, 1) physical effect and course by the disease or accident, 2) hospitalization life, 3) Evaluation of HAL, and 4) life after discharge.

1. Physical effects and course by a disease, the accident

The patients felt incommodiousness of the everyday life for a decrease of the ADL by a disease or the accident.

2. About hospital life

The patients wanted to live their daily life normally, without assistance. They were troubled when they needed assistance from a nurse, but they tended to endure the help of the nurse. It became "the request to a nurse" to have time to talk about with a nurse like "we should be able to talk a little" other than a thing for the assistance. The patients felt dissatisfaction with the schedule for bathing and rehabilitation. They felt dissatisfaction with the use of the restroom. They said that holidays were boring.

3. Evaluation of the HAL

The patients felt that movement to start kept strong. The patients felt that the performance of the HAL improved. The patients felt they wished to continue using the HAL.

4. About the life after the discharge

The patients felt there was not enough rehabilitation at home after the discharge. They always feared falling.

## Discussion

The patients were reserved with a nurse for a thing for the assistance. As for why that happened, it is thought that a nurse was not able to have an opportunity about in hospitalization life. We communicate closely with patients, and it will be important that we build a relationship of mutual trust in the future. This leads to understanding of the needs of the patients and nursing depending on each one. The patients were satisfied with hospital life generally. However, they had anxiety and a sense of fear toward the effect that declined after a discharge. Nursing intervention in consideration of the life after the discharge is necessary. The patients find it easy to imagine the life after the discharge

by doing it. It is a future problem to improve facilities and environment.

## References

1. Takeshita E, et al. Nursing in the acute phase rehabilitation using a robot suit, HAL®. *Brain nursing* 29, 802-810, 2013-08