2018 Abstract of Doctoral Dissertation
Graduate School of Nursing, Sapporo City University

Visualization of skilled use of the hands in nursing and its utilization in training
-Development and verification of a training method with visual feedback-

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I. Introduction

Nurses frequently place their hands on the body of a patient. Skilful use of hands can reduce anxiety and tension and bring comfort to patients in such situations. Some studies have found that less-experienced nurses more often use their fingertips with more pressure than that of their palms, compared with experienced nurses. However, these studies only examined pressure levels at the end of a series of actions, and the appropriate use of fingers and palms during these actions has yet to be determined. Thus, the two objectives of this study are to define skilful use of hands in nursing based on pressure points on patients in contacts with fingers and palms; and to develop and validate a visual feedback method for learning skilled use of the hands.

II. Methods

Experiment 1: The technique used in this study was postural change from a supine position to a lateral position. The subjects were nurses and students. Sensors were attached to the first to fifth fingers and palms of the subjects and the pressure applied at contact points during the postural change was measured. In addition, the comfort level of patients during the postural change was measured using a visual analog scale and autonomic nerve activities. Subjects who were judged to have given greater and lesser comfort to patients were categorized into the Skilled (S) and Less Skilled (LS) groups, and the pressures at contact points of fingers and palms were compared between the two groups. Points with significantly lower pressure in group S were used as criteria for defining the method for skilled use of the hands.

Experiment 2: The subjects in Group LS were further divided into two groups to compare the effectiveness of two training methods: visual feedback training (VT) and hands-only training (HT).The evaluation items for the effectiveness of the training methods were “pressures applied at the contact points of the fingers and palms”, “subjective and physiological evaluations of patients”, “rate of meeting the level reached by group S” and “comments on skilled use of the hands learned through the VT and HT methods”.

III. Results

Experiment 1: The actions with a significant difference between groups S and LS were “raising the head”, “bending the knees” and “placing patients in a lateral position”. The contact points with significantly higher pressure in group LS were the second and third fingers and palm of the left hand and the third finger of the right hand. However, these actions were sequential, with no difference found in the actions before and after them. This showed that the subjects in group LS did not always apply pressure with all fingers, but only with a few fingers in a series of actions. These findings allowed the criteria for skilled use of the hands to be determined.

Experiment 2: There was a significant improvement in the pressure points for all the fingers and palms for raising the head and for some during bending the knees and placing patients in a lateral position after VT. In contrast, no improvement for any pressure points occurred after HT. The rate of reaching the level of group S was significantly higher in VT (60%) compared to HT (10%). “Using whole hands, including the palms”, “using the whole body” and “trying not to apply pressure with fingers” were extracted from the comments on skilled use of the hands learned through both the VT and HT methods.

IV. Discussion

Defining the pressure points of fingers and palms in skillful use of hands during postural change permitted development of a training method with visual feedback that was shown to be useful to learn skilled use of the fingers and palms. In contrast, there was no improvement in actions using the whole hands. This suggests that adjustment of the pressure applied with the whole hand was difficult, compared with the fingers. Our future goal is to measure pressure applied by the whole hands and develop a training method based on these results.

V. Conclusions

1. There was a significant difference in the pressures applied at contact points of the fingers and palms in postural change actions between groups S and LS. These results allowed criteria to be defined for pressure points of fingers and palms for skilled use of the hands.

2. There was a significant improvement in the pressures applied at the contact points of fingers and palms after visual feedback training. This training method was evaluated as effective in improving comfort by 60% of the patients. These results suggest that a training method utilizing pressure levels as visual feedback is effective to learn skilled use of the hands.

In a further study, it will be important to verify relationships with movement and postures.