

Development of Morning Care to Promote the Natural Recovery of Daily Rhythms in Postoperative Acute Patients: The Effects on Orthopedic Ambulatory Assistance

St.Luke's College of Nursing Doctoral Course

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I. Introduction

1. Background

As Japan's society ages, the age of patients undergoing surgeries has also increased, therefore it has become even more important to understand postoperative care for older patients. Normally, postoperative sleep-wakefulness cycles are disturbed by anesthesia and operative stresses. However, in the elderly, recovery is delayed because of degradation of cognitive functions and denaturation of the cerebral suprachiasmatic nucleus (SNC), which is the interior clock. Also, daily rhythms of patients during the early postoperative period are influenced by the disorder of the sleep-awakening rhythm and sleep disorder or degradation of activity motivation by stress due to physical symptoms and inexperience of residing in a hospital. Furthermore, alteration of daily rhythms causes: postoperative delirium, early postoperative ambulation and rehabilitation delays and disturbances in the restoration of health. Hence, Yamada (2008) proposed preventive supports to include daily rhythms beginning from the night of the operation.

The circadian rhythm is regulated in a 24-hour cycle by the early morning light which acts as a synchronizer and the active phase of the cycle is thus set for the day by phase adjustment (Honma, 2005). The early morning is the time shift from the night rest-phase to the daytime active-phase in the daily rhythm, and the patient independently prepares to engage in daytime activities. However, this early morning active phase becomes obstructed for patients needing assistance with walking because they are unable to perform their activities of daily living such as washing or dressing. Furthermore, their physical condition in the morning leads to anxiety about their schedule for the day and the pain not eliminated by sleeping disturbs their independent preparation for activity (Ohashi, 2008b).

Therefore, morning care for patients who have alteration of daily rhythms and delay of ambulation in the daytime could become important daily living activities support from the nursing viewpoint to promote recovery in the elderly. In this study, the author review current morning care which principally involves assistance with face washing from the aspect of daily rhythms, and develop morning care offered by nurses to activate daily rhythms in postoperative acute patients needing assistance with walking.

2. Purpose

The purpose of this study was to develop “the comfort upon rising care” that activates daily rhythms of orthopedic patients who are in the postoperative phase occurring on the third day from the operation and needing assistance with walking.

At first, the author made the comfort upon rising care and evaluation figures. Next, the effectiveness of the comfort upon rising care is verified by comparing the comfort upon rising care group with the usual morning care group in the activation of daily rhythms, and then the practicality is considered on the basis of the evaluation of patients and nurses. The comfort upon rising care is developed by improving and refining of the care content and the concept framework through these processes.

3. Conceptual Framework

The theoretical base supporting the comfort upon rising care was Westfall's nursing chronotherapeutic model (1992) and Klages's phenomenological - psychological - life-philosophical viewpoint related to activation of rhythms (1944). From Westfall's model, the author referred to the use of time cues involved in the reset mechanism of biological rhythms and the timing of nursing interventions. Patients come in contact with synchronizers through environmental arrangements and physical preparations in early morning, so that synchronization of external and internal rhythms is maintained and the base of daily rhythms is made. Also, from Klages' viewpoint, the author referred to the role of time as accent that strengthens rhythms and the role of mental variations such as release of suppressed emotions or joyful emotions that activates rhythms. Regular executions for three days as time make the amplitude in daily rhythms. And care contents designed to meet the support needs of patients to allow the release of suppressed emotions, so that patients' activities in the early morning are improved, and daily rhythms are activated.

Activation of daily rhythms in this study is defined as: the shift from the rest phase at night to the active phase in the daytime, which advances smoothly and suppressed emotions are released, so that activities in mornings can be improved.

4. Study Hypothesis

A. If suppression of emotions for patients is related to comfort upon rising then the comfort upon rising care group will have released more emotions than those in the usual care group and their: (a) “feelings of comfort” will be higher, (b) “vitality for the day” will be higher and (c) mood before and on the third day after the operation will be more improved.

B. If morning activities of patients in the comfort upon rising care group are related to improvement then they will exhibit more improvement than those in the usual care group, specifically: (a) activities of daily living in mornings will increase and (b) breakfast behaviors will be improved.

II. Preliminary Study: making a comfort upon rising care and evaluation figures

In Preliminary Study 1, the author made a comfort upon rising care plan and examined its content validity and evaluation figures through the trial by clinical. First, floor nurses comprising the performed morning care with four postoperative orthopedic patients comprising the usual care group (UC) who needed assistance with walking and the author interviewed and tape-recorded the nurses' explanations about practice activities. Next, the author implemented the comfort upon rising care plan with four other patients comprising the comfort upon rising care group (CUR) and recorded practice activities and responses from the patients. The author interviewed patients in both groups regarding the ease of description and response to the questionnaire to evaluate their mood after receiving care. As a result, the adequacy of the contents was confirmed and the author created a full version of the questionnaire adding some revisions. The author compared the CUR and UC care contents, and clarified similar and different points in the two care methods.

In Preliminary Study 2, at first, the author extracted evaluation figures and made the Wake-Up questionnaire based on reference studies and responses from patients obtained in Preliminary Study 1. Next, the author examined the practicability of the observation systems and the questionnaire through a clinical trial for nine postoperative orthopedic patients, so that they were revised. The post-operative early morning wake-up questionnaire was completed and it was confirmed that the information collection method in the main research was executable.

III. Method

1. Design of the Study

The study design was a quasi-experimental research using convenience sampling and non-random group assignment.

2. Setting and Subjects

Subjects were 80 inpatients (40 for each group) in a suburban Tokyo orthopedic ward. The inclusion criteria were: (a) orthopedic diseases, (b) scheduled for surgery and (c) would need ambulation assistance for about three days after the operations. Exclusion criteria were: (a) patients with dementia and psychiatric disorders and (b) those with communication difficulties in speaking and writing.

To estimate the number of subjects when information is insufficient, the author referred to the estimation method, discussed by Hulley et al. (2007). As the outcome variable was treated as a dichotomous variable the ratio of subjects exceeding the median (P =expected ratio) was assumed to be $P_1=0.45$ for the UC group and $P_2=0.8$ for the CUR group. According to Hulley et al.'s (2007) simple sample size list, the number of subjects needed in the case of $\alpha =0.05$, $\beta =0.2$ and the difference between P_1 and $P_2 =0.35$ was determined that 34 in each group was an adequate size. The target number set for the study was 40 subjects for each group ($N=80$) with an anticipated

dropout rate of 15%.

3. Intervention

1) Morning care performed with subjects

Floor nurses performed either "usual care" or "comfort upon rising care" for subjects beginning the next morning after surgery and continuing for three days.

(1) Usual care

Nurses carried out the standard morning care for the UC group. Care contents included: morning greetings, call for washing face, opening curtains, turning on the lights, arranging articles on their table, assistance with face washing (preparing hot towel and tooth brush) and assistance with elimination.

(2) Comfort upon rising care

Trained floor nurses implemented the nursing care for the CUR group. Care contents included: (Element 1) environmental arrangement for beginning of the day: signals beginning of activity, switching from the night to morning environments and organization of living environment. (Element 2) easing of pain: assessment of pain level and individualized support for their physical and mental status. (Element 3) physical preparations for activity: posture adjustment and dressing. (Element 4) providing the forecast for the days' agenda: reviewing the daily schedule, and advising about goals and how to spend the day.

2) Training for CUR care performed by floor nurses

After the data collection of the UC group, the author conducted 40-day training for providing CUR care using a practice guide. An itemized implementation list was also provided for the floor nurses.

4. Data collection method

1) Data collection period: June to November, 2009.

2) Assignment of intervention

The author avoided simultaneous nursing practice to prevent contamination of the intervention. For the first two months the author collected data from the 40 UC comparison group. During the next, two months, which was after the training for the CUR group, the author collected data from the 40 subjects in the CUR group.

3) Measurement of dependent variables

(1) Release of suppressed emotions

① "Feeling Comfortable" / "Vitality for the day"

Wake-Up questionnaire - Question - I : Completed by subjects before breakfast.

② Mood

Profile of Mood States-Short Version (POMS-SV): 5-point Likert scale with 37 items.

Completed by subjects, at the time of admission (a day before operations) and after breakfast on the third day after the operation.

Note: The questionnaires were filled in on the final day of care because attempting to complete the questionnaire soon after surgery was too much of a burden on the subjects.

(2) Improvement of activities in morning

① Breakfast behaviors:

Observation and measurement by the author for three days after the operation

- a. Wakeful state, 5-point scale: observation at the time of setting the meal (at the time of distribution of Wake-Up questionnaire Q-I)
- b. Posture, 6-point scale: observation at the time of setting the meal and during meal (at the time of distribution of Wake-Up questionnaire Q-I)
- c. Beginning breakfast, 5-point scale: observation at the time of setting the meal
- d. Mood during meal, 4-point scale: interview at the time of clearing the table
- e. Breakfast intake amount: measurement with a digital scale before and after breakfast

② Morning Activities of Daily

Wake-Up questionnaire Question-IV: completed by subjects before breakfast on the third day after the operation

4) Process evaluation of the CUR care

(1) Evaluation by subjects

Practice activities performed by the nurses (Wake-Up questionnaire Question-III), Care satisfaction rating (Wake-Up questionnaire Question-II)

(2) Evaluation by nurses

- ① Qualitatively derived from training group interaction and focused discussions: The author documented the nurses comments regarding practicability and difficulties of providing CUR care during the training period.
- ② Focus group interview after completion of the study: early December. The author performed a focus group interview for around 30 minutes with five nurses to improve the care activity contents.

5) Other: Basic information and confounding factors were collected.

(1) Subject characteristics: gender, age, disease, anxiety (new version State-Trait Anxiety Inventory [STAI]), activities of daily living (daily rhythm, morning living habits), recuperation history (operation, episode of treatment, activity level), early morning physical condition (symptoms, sleep status (Obstructive Sleep Apnea [OAS] questionnaire)

(2) Staff nurse providing intervention characteristics: gender, age, years of experience in clinical practice, years of experience on the current surgical ward, patient-nurse compatibility (Wake-Up questionnaire Question-II)

(3) Environmental characteristics: early morning staffing patterns (patient census, urgent

admission/ sudden changes, examinations, patients needing morning care assistance), early morning hospital room condition (type of room, position of beds, weather, lighting quality (illumination photometry))

5. Analyses

The author used: chi-square test, Mann-Whitney's U-test, f and unpaired t-test for characteristics of nurses providing CUR care, subjects and environment. For dependent variables: chi-square test, Mann-Whitney's U-test, unpaired t-test and two-way repeated-measures ANOVA were employed based on the hypothesis. A factor analysis was performed for Q-I and Q-IV of the Wake-Up questionnaire. Moreover, a covariance structure analysis was performed to estimate effects by adjusting the influence of confounding factors. For a care process evaluation, chi-square test and Mann-Whitney's U test were used. Significant levels were assumed at 5% for both sides. Content analysis was used for qualitative data from interviews. Codes and then themes were identified.

6. Ethical consideration

St. Luke's College of Nursing Research ERB approved the study (approval number: 09-012). The author explained the study to the subjects and nurses including confidentiality, ability to leave the study at any time without prejudicing their care or employment and obtained signed informed consent. Also, the author gave extra consideration so that an excessive burden was not imposed upon subjects in a postoperative condition and other considerations so that actions related with this study could not be forced upon the nurses and become an obstacle to their duties and an excessive workload was not imposed.

IV. Results

1. Characteristics of subjects (subjects, nurse care providers, environment)

Meeting the inclusion criteria were 45 patients for the UC comparison group and 42 patients for the CUR intervention group. Agreeing to participate were 39 patients from the comparison group and 38 patients from intervention group. Completing the study were 36 (92%) patients from the comparison group and 36 (95%) patients from intervention group. Further, data from questionnaires of four patients from the comparison group were not obtained since they became independent before it was completed.

For subject characteristics, significant differences between two groups were recognized in sleeping medication the night before surgery and fatigue recovery scores of OSA. There were no significant differences in characteristics between nurses from the control or intervention group. For environmental characteristics, a significant difference was recognized in the number of blood glucose measurements (nursing situation).

2. Analysis result for hypothesis

1) Result of Hypothesis A: "release of suppressed emotion"

(1) Intergroup differences in a: "feeling comfortable" and b: "vitality for the day"

The intervention group was significantly higher than the comparison group in the mean values in 14 out of 16 items. As a result of a factor analysis, two factors: "feeling comfortable" and "vitality for the day" were extracted. Significant differences were seen in each factor score (feeling comfortable: comparison group $M=-0.60$ ($SD=0.94$), intervention group $M=0.53$ ($SD=0.69$), vitality for the day: comparison group $M=-0.62$ ($SD=0.88$), intervention group $M=0.55$ ($SD=0.61$)) (feeling comfortable: $t(52.25)=-5.81$, $p=.000$, vitality for the day: $t(66.00)=-6.13$, $p=.000$).

(2) Intergroup differences in c: "mood before and on the third day after the operation"

For score differences of POMS before and on the third day after the operation, significant differences were seen in tension-anxious (comparison group $M=0.44$, $SD=8.29$, intervention group $M=-3.97$, $SD=9.39$) and animation (comparison group $Mdn=0.00$, $P25/75=-9.00/4.00$, intervention group $Mdn=4.00$, $P25/75=-1.50/10.50$) ($t(70.00)=2.12$, $p=.038$, $U=428$, $p=.013$).

2) Result of the hypothesis B: "improvement of morning activity"

(1) Intergroup difference in a: "living activities in mornings"

The intervention group was significantly higher than the comparison group in the number of performances in 9 out of 21 items. As a result of a factor analysis, three factors, "preparation for activity (dressing and a schedule)", "spontaneous activity" and "simple face washing and brushing teeth" were extracted. Significant differences were seen in each factor score (preparation for activity: comparison group $Mdn=-0.84$ ($P25/75=-0.95/-0.73$), intervention group $Mdn=1.05$ ($P25/75=-0.21/0.32$), spontaneous activity: comparison group $Mdn=-0.44$ ($P25/75=-1.31/-0.01$), intervention group $Mdn=0.66$ ($P25/75=0.14/1.06$), simple face washing and teeth brushing: comparison group $Mdn=0.26$ ($P25/75=-1.8/0.40$), intervention group $Mdn=0.48$ ($P25/75=0.29/0.62$)) (preparation for activity: $U=100.00$, $p=.000$, spontaneous activity: $U=200.00$, $p=.000$, simple face washing and teeth brushing: $U=349.00$, $p=.005$).

(2) Intergroup difference in b: "breakfast behaviors"

For each breakfast behavior for three days after the operation, significant differences were seen in items other than the posture, while eating on the third day after the operation and the breakfast intake rate on the first day after the operation. The intervention group was significantly higher than the comparison group. An interaction effect (day \times care) was seen at the beginning of eating breakfast, posture while eating and mood during the meal ($F=3.32$, $p=.032$, $F=4.07$, $p=.027$, $F=5.83$, $p=.006$). The wakeful state, the posture before meal and the breakfast intake rate rose each day days with both groups, while the variables, beginning to eat breakfast, posture while eating and mood during meal, in the intervention group, were high from the first day after the operation. Thus, hypothesis A and B were supported.

3. Estimation of effect by adjustment of confounding factors

Since the nursing care activities and patient's responses are similar, by using the data from both groups, the author made a conceptual model for the effect of morning care. The model included: "high quality sleep" as a confounding factor, which consisted of "ample morning preparation", "rising", "feeling comfortable", "vitality for the day", "independent meal preparation" and "promotion of breakfast intake". A covariance structure analysis was performed on the model. Fit indexes were CFI=0.921, RMSEA=0.077 and a statistically acceptable level was obtained. Next, in order to discuss if dependent variables adjusted by the confounding factor were different depending on care, the author applied the variable of CUR care to the above model. Fit indexes were CFI=0.904, RMSEA=0.086 and an acceptable level was obtained. Significant path coefficients between dependent variables were "ample morning preparation"→"feeling comfortable" ($\beta=0.76$); "ample morning preparation"→"rising" ($\beta=0.99$); "feeling comfortable"→"vitality for the day" ($\beta=0.63$); "rising"→"vitality for the day" ($\beta=0.83$); "vitality for the day"→"independent meal preparation" ($\beta=0.53$) and "independent meal preparation"→"promotion of breakfast intake" ($\beta=0.93$). Significant path coefficients from care to dependent variables were "care"→"ample morning preparation" ($\beta=0.83$); "care"→"independent meal preparation" ($\beta=0.52$) and "care"→"vitality for the day" ($\beta=0.53$).

4. Process evaluation of the comfort upon rising care

1) Evaluation by subject patient

Of the 12 practice activities performed by the nurses, 11 were significantly higher in the intervention group than the comparison group; only physical supports lacked significance. Care satisfaction rating was Mdn=3.00(P25/75=2.00/3.00) for the comparison group and Mdn=5.00(P25/75=4.00/5.00) for the intervention group (U=157.00, p=.000).

2) Evaluation by nurses

(1) Interview during training

From the interview about difficult aspects of practice and operability of care, the schedule sheet was revised during the training and additional materials about concrete examples and roles were distributed.

(2) Focus group interview after completion of research

When asked about the more difficult aspects of providing nursing care activities, half of the comments were about time, such as, 'it takes time for some patients' and 'there is time pressure'. The respondents mentioned advice for schedules and goals, environmental arrangements and cosmetics as positive nursing activities and a number of them noted that it was appropriate to practice this type of care for postoperative patients.

About the materials provided for the intervention group, some nurses mentioned that it is easier for them to use a nursing care activity item list than the guide at bedside. Some nurses

commented that it was difficult to verbally explain the schedule sheet to the patient who was not able to read the sheet.

The training was evaluated as appropriate. As a change of practice after the training, there was an increased awareness of the new practice for each day and application in the daytime. However, the floor nurses did not acquire the process perfectly during the study period.

V. Discussion

1. The effect of morning care

Covariance structure analysis clarified that morning nursing care was linked to "ample morning preparation" which then increased "feeling comfortable" and "rising". Furthermore, "vitality for the day" that arose from the previous three variables led to "independent meal preparation" and that led to "promotion of breakfast intake". Next, the theoretical validity of the Morning Care Effect Model (MCEM) and the effect of morning care on postoperative acute patients is considered as follows

The first set of relations is considered: "ample morning preparation" improved "feeling comfortable" and "feeling comfortable" improved "vitality for the day". From the three-factor model of mood proposed by Matthews et al. (1990), I assumed that "feeling comfortable" was the condition whereby discomfort and uneasiness were removed allowing for an increase of the degree of pleasantness feeling. I also assumed that "vitality for the day" such as stable mood and motivation indicated a decrease in tension upon awakening of the subjective vigilance two factors that correlated with pleasantness degrees and rising of energy upon awakening.

Next, the relations of "ample morning preparation" improved "rising" and "rising" improved "vitality for the day" are considered. The ascending reticular activating system (ARAS) receiving a number of stimulus inputs from various sensations awakens the brain cortex (Magoun, 1963), therefore stimulation to the brain resulting from ample morning preparation increases awaking and rising is promoted. The wakeful state also improves stimulation to the brain through visual information from the broader point of view attained by "rising". If evocation (awakening) levels increase, emotion increases (Hebb, 1972). Therefore, promotion of "rising" led to "vitality for the day".

Third, the relations of "vitality for the day" promotes "independent meal preparation", which led to "promotion of breakfast intake" are considered. With an increase in "vitality for the day", the postoperative patient was better able to engage their will power and use their judgment to enact the behavior necessary for independent meal preparation; as a result promotion of breakfast intake occurred. The patients possibly promoted the breakfast actions and gave higher scores for their good temper and by the mood congruity effect, which is the effect that emotion gives to perception (Bower, 1981). Nurses should arrange a situation in which patients can independently prepare breakfast.

Thus, these flows of events support the logical consistency of the MCEM. Morning care that

brings about an effect to postoperative acute patient's mind and body's awaking and promotion of breakfast behaviors is very important as daily living activities support to make postoperative daily rhythms and promote recovery.

2. The effectiveness of CUR care

It has been confirmed that CUR care had a direct effect on "ample morning preparation" and "independent meal preparation". CUR had an indirect effect on "vitality for the day" that transmitted "feeling comfortable" or "rising" through "ample morning preparation". The effectiveness of CUR care is considered as follows.

1) Direct effect of CUR on "substantiality of preparation in morning"

Patients' morning activities and behavior increased because CUR contained a number of nursing actions intended to support the patient's needs. CUR care is more effective than usual care so that it may directly improve activities in the morning.

2) Indirect effect on "vitality for the day"

"Feeling comfortable" improved by "substantiality of preparation in morning" an indirect effect of CUR care suggested that all four care elements were suitable. Steady implementation by voice imposing confirmation in element one and three which had commonality with usual care increased patient's response. Element two needed before wake up and body preparation enhanced patient's ease. An aspect of element three listening to each patient's wish had an impact on "feeling comfortable" and "vitality for the day". Element four, the method that CUR care nurses only used, reduced anxiety of postoperative patients. Therefore, CUR care was more effective than usual care so that elements 1~4 improved "feeling comfortable" and "vitality for the day".

CUR care significantly improved the tension anxiety score and the vigor score in POMS. In general, anxiety of postoperative patients is reduced a few days after the operation. Therefore the UC group was experiencing post-operative anxiety before this process and the CUR care reduced the typical post-operative anxiety more than usual care.

The wakeful state and posture before breakfast as the index of "rising" increased along with the postoperative days in both groups. The CUR care group wakeful state was significantly higher than the UC group each of the three days after the operation. In CUR care, patients sat up straighter before they prepared to wash and groom themselves. Therefore patients' activities increased more than with usual care, which then increased the stimulation to their brain and improved arousal levels. The limbic cortex of the brain related to ARAS is related to emotions and incentives (Hebb, 1972) and perception and ideation performed in brain cortex activates ARAS (Hebb, 1972). Therefore "rising" was promoted because providing the postoperative patients with a reason for postoperative morning care and the usual morning preparation in element three and four (the activity plan) became motivations for activities. In the CUR care influence model, the path coefficients from "rising" to "vitality for the day" were larger than the MCEM. An indirect effect of

"vitality for the day" through "rising" characterized the effectiveness of this care. Therefore, CUR care was more effective than usual care so that this care improved "vitality for the day" through "rising".

3) Direct effect on "independent meal preparation"

The wakeful state and posture before breakfast as the index of "independent meal preparation" and mood during breakfast as the index of "promotion of breakfast intake" rose along with the postoperative course in both groups. The CUR care group was high from the next day of after the operation. Breakfast intake rate as the index of "promotion of breakfast intake" rose along with the postoperative days in both groups. Breakfast intake rate in the CUR care group was significantly higher than in the UC group after the second day of operation. This care, most likely, promoted the natural recovery of breakfast behaviors after the operation more than usual care because of a direct effect and an indirect effect ("vitality for the day") to "independent meal preparation".

The indirect effect ("vitality for the day"), assumed that a decrease of tension upon awakening and a rise of energy upon awakening was supported by the three-factor model of mood proposed by Matthews et al. (1990). Middle-class evocation (arousal) levels for optimal actions were obtained through CUR care (Hebb, 1979) and it led to smooth breakfast actions. Hebb (1979) stated that the arousal system is a necessary effective brain cortex action however it is the limbic cortex that provides what goals are to be met; therefore, it is not only the indirect effect "vitality for the day" and it is necessary to attach importance to the direct effect to lead the patient to breakfast behaviors as the first step of activity of the daytime. Element four (using a schedule sheet before breakfast) can be a direction to breakfast behaviors and to directly promote "independent meal preparation" and "promotion of breakfast intake". A direct effect on breakfast behaviors is not mediated by the body clock and is described as a direct drive or masking effect by Westfall (1992) in her discussion of chronotherapy nursing models. Therefore, CUR care is more effective than usual care as a method that promotes the natural recovery of daily rhythms after an operation.

CUR care increases the mind and body's wakeful states, promotes the recovery of breakfast behaviors, and facilitates the recovery of patients' mental state after the operation. In summary, CUR care was more effective than usual care as a daily living behavior support to promote the natural recovery of daily rhythms after an operation.

3. Evaluation of CUR care content and care training

Patients evaluated the content of CUR. Patient satisfaction for CUR care as high and this care was not judged as invasive. Nurses' evaluated of the care content; thus, support examples for different patient conditions were added to the guide and the protocol was corrected becoming a short guide. In the future, researchers should consider developing and using a schedule by patients who are not able to read letters and improved training methods for nurses.

4. Revision of concept frame of this study

The author revised the conceptual framework of this study. The mechanism of awaking, the masking effect of Westfall model and motivations for activities due to element 4 were added to a theoretical base. "Activation of daily rhythms" was changed to "natural recovery of postoperative daily rhythms" and the name of CUR care was corrected to "daily rhythms recovery promotion care".

VI. Conclusion

The effectiveness of CUR care for the assistance of postoperative orthopedics ambulatory patients was verified, and the following was clarified.

1. Intervention group's individual factor scores for "feeling comfortable" and "vitality for the day" were all significantly higher than the comparison group. A significant difference was seen in the tension anxiety score and the vigor score in POMS supporting study hypothesis A regarding CUR promoting "release of suppressed emotion".

2. Intervention group's individual factor scores for "preparation for activity", "spontaneous activity" and "simple face and teeth washing" were all significantly higher than that of the comparison group. "Breakfast behaviors" of three days after the operation was significantly high, excluding the breakfast intake rate on the first day after the operation and posture while eating on the third day after the operation. Thus hypothesis B, CUR leading to "improvement of morning activity" was supported.

3. The morning care effect model was created. It was clarified that "ample morning preparation" through morning care improved "feeling comfortable" and "rising". The next state, "vitality for the day", improved "independent meal preparation" which led to "promotion of breakfast intake".

4. CUR care influence model was created. It was confirmed that CUR care had a direct effect on "ample morning preparation" and "independent meal preparation" and had an indirect effect on "vitality for the day" that transmitted "feeling comfortable" or "rising" through "ample morning preparation". CUR care was more effective than usual care as a daily living behavior support to promote the natural recovery of the daily rhythms after an operation. The conceptual framework of this study was corrected and the name changed to "daily rhythms recovery promotion care".

5. The process evaluation indicated that patient satisfaction was high. From nurses' comments of the care content, support examples for different patient conditions was added to the guide and the protocol was corrected and became a short guide version.

6. Future tasks are to create an introduction method for nurses, develop care contents for patients who cannot read or independently sit-up or eat, and expand research to include other facilities for generalization.