

Effect of Touch Care and Fomentation Use in Nursing Care *Examination from Fingertip Pulse*

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Keywords: Touch care, Foot bathing, Fingertip pulse wave, Nursing care.

Abstract: Concerning the effectiveness of foot bathing and Touch Care as care-giving methods, verification was obtained by physiological data gathered from fingertip pulse and vital sign readings, as well as a survey questionnaire. In testing each care method, namely, carbonated water bathing, lower leg Touch Care, foot bathing, and foot bathing + Touch Care, readings were taken 3 times: before, immediately after, and 10 minutes after completion of the procedures. The results were as follows: These nursing cares showed effectiveness 77.8% - 90% of the cases. The various methods showed an improvement in participants' mood in the following order of effectiveness: foot bathing + Touch Care, Touch Care, carbonated water bathing, and foot bathing. When comparing only to foot bathing, foot bathing + Touch Care had a greater effectiveness in warming the body. Touch Care and foot bathing + Touch Care showed effectiveness in improving blood circulation, and carbonated water bathing showed effectiveness in warming the body without altering vital signs. The procedures' results showed the importance of applying these care techniques to the type of care most suitable for the subjects, and the importance of application in regard to support of mental health.

1 INTRODUCTION

1.1 Research Background and Purpose

Since the birth of nursing care as a specialized vocation in the 19th century, there has been a continual search to discover which techniques should be used to promote patients' vitality, advancement of rehabilitation processes, and the most beneficial means of achieving health of mind and body.

Nursing care related to cleanliness and comfort goes beyond the general concept of merely being clean or comfortable, but rather, involves the healing of disease, the discussion of effective means of pursuing good health, involving actual cases where disease conditions are improved by nursing care. Accordingly, this is not the product of coincidence, but rather by establishment of nursing care based on evidence of the effectiveness of intentional implementation of vocational nursing, and in order to propagate good nursing, there needs to be an examination of the scientific techniques of nursing care.

In 2013 we conducted research into the examination of the effectiveness of Touch Care (baby massage) involving mothers and their infants. Effectiveness with both mothers and their children was recognized, and in order to promote the advancement of baby massage, environment, timing, and related vocations were suggested as important factors.

Application of Touch Care is a simple and non-invasive care technique, and is an increasingly desirable technique on the nursing scene. At the same time, fomentation - the technique of applying hot compresses to warm the body - is also spoken of as a means of nursing care for the effective promotion of health and relief of pain in patients. Nurses can individually judge between the practice of these techniques, and can expect repeated effectiveness regarding comfort, health promotion, maintenance of cleanliness, improvement of general condition. Moreover, these are techniques which are implemented simply, without the need of reliance upon medical instruments. It can be said that these techniques should increasingly be introduced in

medical institutions, elderly care facilities, and residential settings.

So far, initial research of the effectiveness of fomentation treatment and Touch Care has involved examination and understanding of autonomic nerve balance through testing of saliva, electromyogram, blood circulation, ECG, as well as EEG, and use of physiological indexes. This initial research has been productive, and the effectiveness of these care techniques has been definitely verified. However, up to this point, judging the value of the sense of contentment and mental healing for recipients of these care techniques has been limited to comments of the recipients' awareness, such as "It felt good", or "I felt comfortable". The objective examination of this kind of emotional effect remains the field of study for Touch Care and fomentation treatment research.

Our aim this time in research is an objective examination of the effects of fomentation treatment and Touch Care nursing care techniques by means of understanding emotional flexibility and good health from non-linear analysis of fingertip pulse fluctuations. At the same time, autonomic nerve balance will be measured, and effort will be made to grasp the influence of fomentation treatment and Touch Care upon the autonomic nervous system.

1.2 The Effect of Touch Care

While foot bathing as one type of fomentation Touch Care is defined as contact through massage, and has been described as a means of forming a bonding relationship between mother and child, the Hirohashi group, through results of infant fingertip pulse measurement, determined that "the infant's autonomic nervous system was under tension, relaxed immediately after application of the mother's Touch Care, and then 10 minutes after cessation of Touch Care returned to the prior tension". This led to the conclusion that by means of the parent's close contact during these fluctuations, bond formation with the infant was progressing.

There are reports that Touch Care, using light pressure and causing muscle relaxation, from the time massage begins, well-known emission of oxytocin is recognized, and at 10 minutes and again at 20 minutes after beginning massage, for a brief time oxytocin concentration roughly doubles. That is to say, with Touch Care oxytocin levels are a key factor.

Known effects of oxytocin are, 1) decrease in anxiety, and strengthening of sociability and child-rearing activities, 2) strengthening of "social memory", 3) action affecting tranquility and pain relief, 4) improvement of learning capacity, 5)

reduction of blood pressure, 6) body temperature regulation (causing warmth to be transferred to other body parts, working like a thermostat), 7) regulation of digestive activity, 8) control of body fluids, 9) enhancement of growth, and injury healing.

The foot has a high level of nerve sensitivity, and by means of Touch Care, results such as reduction of peripheral blood vessel contraction, rise in temperature at sole of the foot, as well as feelings of comfort and physiological relaxation are obtained. This is due to vagus nerve activity, and operates on the following areas: control and stabilization of heartrate, blood pressure, and respiration rate, reduction of norepinephrine and epinephrine concentrations, reduction of stress-related cortisol reaction, provides a link to stress relief, and leads to stabilization of depression and anxiety in both body and mind. Furthermore, by means of muscle relaxation, stimulation of the digestive tract to encourage digestion, as well as advancement of serotonin secretion, growth rate of newborns and nursing infants is heightened, sleep activity is improved, and a smooth transition between sleep and awakening is clearly observed.

The Kato's group (2006), in order to ascertain the influence of cortisol on food intake, conducted a survey of Touch Care participants using samples of CgA found in saliva, reported that amounts of CgA in saliva decreased, and also reported that readings of middle finger surface blood vessels indicated dilation, and during contraction showed a reduction of blood pressure. These findings suggest that there is a "mutual response" effect between both the giver and the recipient of massage.

1.3 The Effects of Foot Bathing

In addition to the purpose of maintaining cleanliness, foot bathing has other experientially known effects, such as promotion of blood circulation, maintaining body warmth, relaxation and refreshment. Foot bathing methods have been the object of various research studies, examining ways to produce effective results. Foot bathing, by means of stimulating warmth, promotes expansion of blood vessels in the feet, increases body temperature at the surface of the feet, causes a significant increase of blood flow in the feet, and by warming the peripheral blood supply which circulates throughout the body, skin temperature of the upper limbs is elevated. Furthermore, through the influence of foot bathing, the following tendencies are revealed:

- 1) From the reflection of autonomic nerve activity, electrocardiogram wave-to-wave intervals

obtained from the chronological frequency analysis fluctuations in heartbeat affecting cardiac autonomic nerve activity.

- 2) High Frequency and Low Frequency/High Frequency analysis of rise/fall component from fluctuations in heartbeat.
- 3) From analysis of brain waves, observation of temporary fluctuations of tension in autonomic nerves.
- 4) Relaxation effect from control of sympathetic nervous system and increased activity of parasympathetic nervous system.

From subjective evaluation of the effects of warmth and pleasurable sensations, as a result of using Profile Of Mood States (POMS) and Visual Analog Scale (VAS), the following results were reported: trends of measured increase in levels of "vigor", decreased levels of "fatigue", an increase in responses of "the body is hot"/"the body is warm". In addition, regardless of the lack of median temperature rise from bathing, it was clear that many participants expressed that their body core and extremities were warmer. Considering the psychological effect of an awareness that "I am warmer" being brought about, the stimulated sense of warmth signifies a meaningful connection to various effects of relaxation.

In recent years, carbonated spring water foot bathing has been used for medical treatment of ulcers and blockages from arteriosclerosis, and use of carbonated spring water to increase blood flow to the skin is clearly superior to that of fresh water bathing. The phenomenon of red-flushed skin of the feet when placed in carbonated spring water is considered to be related to the increase of blood flow due to dilation of the blood vessels in the skin, a result of prostaglandin E2 which strongly triggers blood vessel expansion. Furthermore, foot bathing in carbonated spring water has the effect of increasing blood circulation at the skin's surface over the entire body, and shows significant benefits regarding muscle tension, improvement of joint motion, feelings of relaxation, as opposed to fresh water bathing. When viewing the above factors, carbonated spring water foot bathing appears to show a high degree of effectiveness of foot bathing.

Treatment and Touch Care (massage) are simple procedures, and while it is said that these care techniques produce significant amounts of emotional calming, the current status is that these techniques are not often implemented in the busy environments of hospitals and other facilities. If, through examination of data from fingertip pulse readings, it can be verified that fomentation treatment and Touch Care have a significant effect of improving the

maintenance of mind and body wellness, we believe that its introduction and promotion in the medical and health care communities will be advanced.

1.4 Research Significance

While foot bathing as one type of fomentation treatment and Touch Care (massage) are simple procedures, and while it is said that these care techniques produce significant amounts of emotional calming, the current status is that these techniques are not often implemented in the busy environments of hospitals and other facilities. If, through examination of data from fingertip pulse readings, it can be verified that fomentation treatment and Touch Care have a significant effect of improving the maintenance of mind and body wellness, we believe that its introduction and promotion in the medical and health care communities will be advanced.

Also, even without being specifically directed by physicians, the scientific examination of the effectiveness of available fomentation treatment and Touch Care can connect and further the establishment and development of these techniques as areas of study in nursing education.

2 RESEARCH METHOD

2.1 Subjects of Survey

Nursing students and faculty members, who consented to participate, were the subject of this study. For each type of fomentation treatment and Touch Care experiment, approximately 10 people were chosen, with a plan of 40 people in all participating, but the actual results were obtained from the following: carbonated hot spring water foot bathing - 9 persons; lower leg Touch Care - 11 persons; foot bathing - 10 persons; foot bathing and Touch Care - 15 persons; Total - 45 participants. Subjects were as follows: Participants - 33 persons; male participants - 3 persons; female participants - 30; average age - 24.8 years old.

2.2 Survey Period

January - March, 2015.

2.3 Survey Method

The following was addressed:

- ① foot bathing (hot water only, 10 minutes),
- ② foot bathing (hot water with carbonation added, 10

minutes. 40°C with approx. 1000 ppm concentration of carbonic acid. Because carbonic acid concentration decreases as temperature increases, water was not able to be heated much.), ③ lower leg Touch Care (massage foot region / lower leg region / thigh region. Hand massage was applied for 2 - 4 times), ④ foot care with combined hot water foot bathing and Touch Care (10 minutes, 4 types of care were applied).

With each type of care, the participants' vital signs (body temperature, pulse, blood pressure), skin temperature (back of hand, base of thumb, top of foot, base of big toe, chest area, etc.), and fingertip pulse were measured at three intervals: before treatment, immediately following treatment, and 10 minutes after treatment. Fingertip pulse readings were obtained by measuring pulse fluctuations by means of installed computer software *LYSPECT*, and each reading measured the pulse for 3 minutes. Upon completion of measurement readings for all participants, all data was analyzed for study. Concerning the analysis method, non-linear / SPSS analysis with computer software *LYSPECT* was used. At the same time, the participants were asked to complete a questionnaire related to their mood and level of contentment as a result of the treatment, and that data was combined with the physical test data for comparison.

3 types of questionnaire were prepared. The 1st type showed a 20 - step face scale (Fig.1), and prior to treatment asked the subject to give their own assessment, placing a circle around the number of the face that most closely resembled their mood. The 2nd type of questionnaire used the same face scale, and asked the participant to indicate their mood immediately following treatment, and also at the conclusion of the experiment. The 3rd type of questionnaire asked the participant to indicate their overall mood regarding the treatment, and in what kind of scenario would they choose to receive this kind of treatment again.

Moreover, for lower leg Touch Care and Touch Care while receiving foot bathing treatment, one person with proficiency in these techniques was placed in charge of the group, so as to maintain uniformity of technique as much as possible.

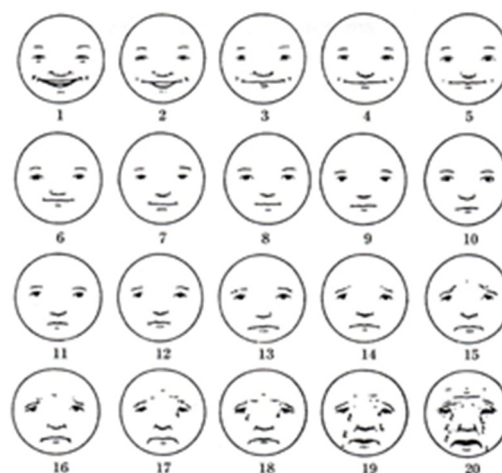


Figure 1: Face scale.

2.4 Method of Analysis

For each type of care treatment, regarding the readings of variations in body temperature, pulse, blood pressure, and skin surface temperature, the degree of rise and fall of the numerical values was analyzed. Concerning fingertip pulse, as an indicator of mental adaptability (wellness), if the Largest Lyapunov Exponent (LLE) numerical value showed an increase, it was judged that treatment was effective. When determining whether the sympathetic nerve or parasympathetic nerve was superior, if autonomic nerve balance (ANB) values were near to a precisely good balance, or if the parasympathetic nerve showed superiority, and it was observed that the participant was in a relaxed state, it was judged that the care treatment was effective.

On the questionnaire, numerical values were assigned to variations in response on the face scale, showing the difference in participants' moods before and after treatment, and numerical ranking was assigned to the answers given regarding mood fluctuations and their associated stimuli.

3 RESULTS

3.1 Subject of Research / Location

27 students and 5 faculty members from the nursing education department of N University participated as test subjects. Of these, 3 were male and 29 were female. The subject numbers for each type of test were as follows: Carbonated water foot bathing - 9 persons, Touch Care - 11 persons, Foot bathing - 10

persons, Foot bathing + Touch Care - 15 persons. Testing was conducted in the training lab of the N University nursing department; the subjects' vital signs, skin temperature, and fingertip pulse readings were measured before and after the Care application sessions. Room temperature was 21 - 22 °C. Temperature of the water used for foot bathing was 40 °C. For the carbonated water foot bath and regular foot bath tests, subjects' feet were placed in water for 10 minutes. For subjects participating in foot bathing + Touch Care, during the 10 minutes feet were in the water, the subject's feet were washed with soap and massaged. For those being tested with lower leg Touch Care, the feet / lower legs / thighs / upper thigh areas were massaged.

3.2 Test Measurement Results

3.2.1 Fingertip Pulse Values

Results showed that LLE values rose, and mental activity was stimulated; ANB values arrived at a good balance, and parasympathetic nerve activity was dominant, indicating a relaxing effect. (Fig.2).

3.2.1.1 Carbonated Water Bath

Testing showed that carbonated water bath care was effective in 77.8% of test subjects (7 out of 9 persons), and ineffective in 22.2% (2 out of 9 persons) of the subjects. Of this group, results showing subjects experiencing effective mental activity stimulation were 71.4% (5 out of 7 persons), and those showing signs of relaxation were 28.6% (2 out of 7 persons), as depicted in Fig. 3.

3.2.1.2 Lower Leg Touch Care

Those recipients showing effectiveness were 90.9% (10 out of 11 persons), and those showing non-effectiveness were 9.1% (1 out of 11 persons). Of these, results showing subjects experiencing effective mental activity stimulation were 30.0% (3 out of 10 persons), and those showing signs of relaxation were 70.0% (7 out of 10 persons), as depicted in Fig. 4.

Carbonated foot-bath			Touch care			Touch care +Foot bathing		
No.1	LLE ↓ ANB →	×	16	LLE ↑ ANB ↓	○	31	LLE ↑ ANB →	○
2	LLE ↑ ANB ↑	○	17	LLE ↑ ANB ↓	○	32	LLE ↓ ANB ↓	○
3	LLE ↑ ANB ↓	○	18	LLE ↑ ANB ↓	○	33	LLE ↓ ANB ↑	×
4	LLE ↓ ANB ↑	×	19	LLE ↑ ANB ↓	○	34	LLE ↑ ANB ↓	○
5	LLE ↑ ANB ↓	○	20	LLE ↑ ANB ↓	○	35	LLE ↑ ANB ↓	○
6	LLE ↑ ANB ↓	○	Foot bathing			36	LLE ↓ ANB ↑	×
7	LLE ↑ ANB ↑	○	21	LLE ↑ ANB ↑	○	37	LLE ↑ ANB ↓	○
8	LLE ↑ ANB ↑	○	22	LLE ↑ ANB ↑	○	38	LLE ↑ ANB ↓	○
9	LLE ↑ ANB ↑	○	23	LLE ↓ ANB ↓	○	39	LLE ↑ ANB ↑	○
Touch care			24	LLE ↑ ANB ↑	○	40	LLE ↑ ANB ↑	○
10	LLE → ANB ↓	○	25	LLE ↓ ANB →	×	41	LLE ↑ ANB ↑	○
11	LLE → ANB →	×	26	LLE ↓ ANB ↓	○	42	LLE ↑ ANB ↓	○
12	LLE ↑ ANB ↓	○	27	LLE ↓ ANB ↑	×	43	LLE ↑ ANB ↓	○
13	LLE ↑ ANB ↓	○	28	LLE ↑ ANB ↓	○	44	LLE → ANB ↓	○
14	LLE ↑ ANB ↓	○	29	LLE ↑ ANB ↓	○	45	LLE ↑ ANB ↓	○
15	LLE ↑ ANB ↑	○	30	LLE ↑ ANB ↓	○			

Figure 2: The effect of LLE and ANB.

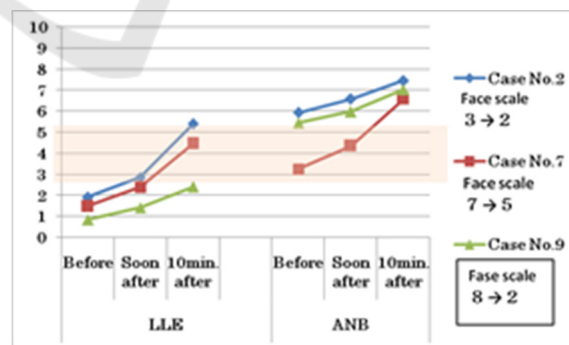


Figure 3: LLE rise (active) of carbonated water bathing.

3.2.1.3 Foot Bathing

Those recipients showing effectiveness were 90.0% (9 out of 10 persons), and those showing non-effectiveness were 10.0% (1 out of 10 persons). Of

these, results showing subjects experiencing effective mental activity stimulation were 33.3% (3 out of 9 persons), and those showing signs of relaxation were 66.7% (6 out of 9 persons), as depicted in Fig. 5.

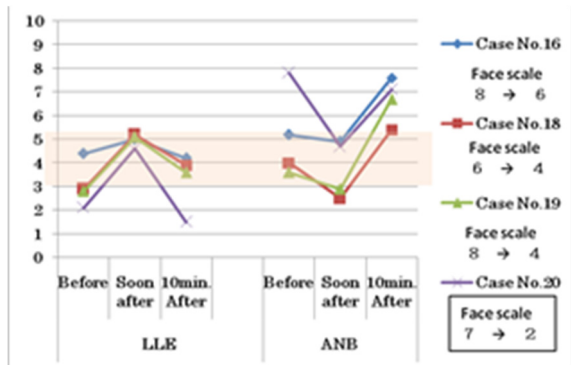


Figure 4: ANB down (relax) of Touch care.

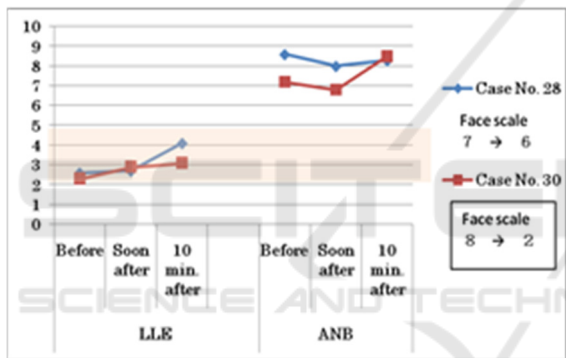


Fig.5: ANB slightly down (relax) of Foot bathing.

3.2.1.4 Foot Bathing + Touch Care

Those recipients showing effectiveness of foot bathing + Touch Care were 86.7% (13 out of 15 persons), and those showing non-effectiveness were 13.3% (2 out of 15 persons). Of these, results showing subjects experiencing effective mental activity stimulation were 38.5% (5 out of 13 persons), and those showing signs of relaxation were 61.5% (8 out of 13 persons), as depicted in Figure 6.

The overall results from the 4 different Care procedures were as follows: responses showing effectiveness were 86.7% (39 out of 45 persons), and those showing non-effectiveness were 13.3% (6 out of 45 persons).

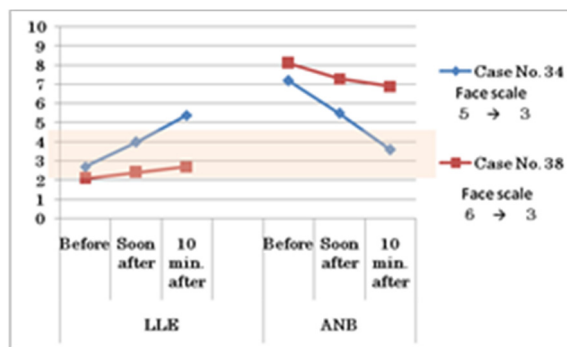


Figure 6: LLE rise ANB down (active and also relax) of Foot bathing + Touch care.

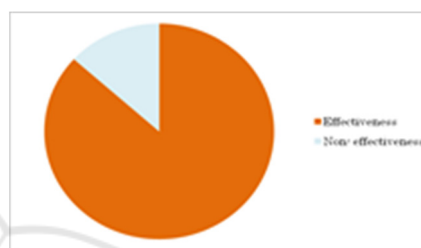


Figure 7: Effectiveness (= 86.7%).

3.2.2 Skin Temperature and Blood Pressure / Pulse Fluctuations

3.2.2.1 Carbonated Water Bath

Temperature readings of the eardrum, chest area, back of the hand, thumb, top of the foot, and big toe all showed a significant rise immediately following carbonated water bathing, and the eardrum temperature still showed an elevated reading 10 minutes after bathing. There were no indications of change in blood pressure or pulse readings.

3.2.2.2 Lower Leg Touch Care

The eardrum temperature showed a rise immediately after the procedure, as well as at 10 minutes afterward. Blood pressure and pulse readings both indicated lower readings immediately after the procedure and at 10 minutes afterward.

3.2.2.3 Foot Bathing

The chest area, back of the hand, top of the foot, and big toe temperature readings showed a rise immediately following testing, and only the chest area showed an increased temperature reading at 10

minutes afterward. However, the eardrum temperature showed no elevation. Blood pressure and pulse readings were lower immediately following the procedure, and at 10 minutes afterward an elevated fluctuation was observed.

3.2.2.4 Foot Bathing + Touch Care

The eardrum, chest area, back of the hand, thumb, top of the foot, and big toe temperature readings all showed a significant rise immediately following foot bathing + Touch Care. Also, the eardrum, chest area, back of the hand, and thumb temperatures continued to be elevated 10 minutes afterward. Blood pressure readings were lower immediately after the procedure, as well as 10 minutes later. Pulse readings were lower immediately following testing, but rose 10 minutes later.

3.2.3 Questionnaire

3.2.3.1 Face Scale

Of the 45 participants, 42 persons indicated on the face scale (by selecting a smiling face) that they felt an improvement to their mood after the Care procedure, as compared to how they felt prior to the experiment. After completing the procedure, 3 respondents selected the same face on the scale that they had chosen prior to the experiment (indicating no improvement in mood). However, these 3 persons all had fingertip pulse data that judged the Care procedure as ineffective in their cases. Also, with these 3 persons, the comparative breadth of overall mood improvement suggested that they initially began the experiment in a negative mood, as depicted in Fig. 8 and Fig. 9.

3.2.3.2 Application of the Care

On the questionnaire, participants were asked to indicate in what scenarios they would be inclined to utilize the Care procedure they had received.

From the participants' accounting of the results, the content was divided in order of "sub-category", "category", and "core category", and thus core factors were extracted. Numerous respondents indicated that carbonated water bathing as a type of care which results in improvement of blood circulation, and care that supports a person's mental aspect, would be desirable. With Touch Care, numerous respondents recorded that they felt that its implementation helped their overall mental state, followed by relief from fatigue and improvement in blood circulation. With foot bathing and foot bathing + Touch Care,

respondents indicated a support of mental state, and an improvement in body warmth from feeling chilled.

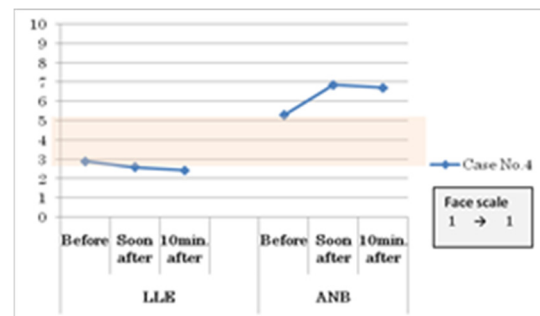


Figure 8: Non-effectiveness and no change on the face scale (Case No.4 : Carbonated water bath).

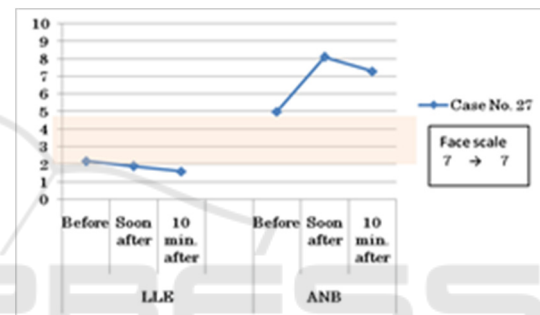


Figure 9: Non-effectiveness and no change on the face scale (Case No.27: Foot bathing).

4 CONSIDERATION

4.1 Considerations from Results of Fingertip Pulse Measurements

Analysis of LLE and ANB values taken from fingertip pulse readings yielded the following results: carbonated water bathing showed 80% effectiveness, and Touch Care / foot bathing / foot bathing + Touch Care all showed 90% effectiveness. Using data gathered from physiological information, it was judged that these procedures are effective as methods of nursing care. From prior research, it is believed that the methods used in this experiment are effective as an aid to healing. However, carbonated water bathing showed an activated effectiveness, and in proportion to the other methods of Touch Care, foot bathing, and foot bathing + Touch Care, it showed a high degree of effectiveness in bringing about relaxation, and showed a unique pattern different than the others. For this reason, it became apparent that in order to select

the most suitable care for individual subjects, assessment of whether the subject feels cold, and observation of their current state of mind and overall body condition must be carefully noted. It was also determined that it is good to give the subject an explanation of the effects from each kind of care, and allow the subject to choose the type of care most desirable to them.

4.2 Considerations from Vital Signs Data

From body temperature readings, it was observed that, excluding foot bathing, the methods of carbonated foot bathing / Touch Care / and foot bathing + Touch Care all brought about a significant rise in core body temperature. The procedure results showed an influence upon the body with dilation of peripheral blood vessels, and a rise in temperature measured on the sole of the foot. With the foot bath, body surface temperature rose briefly, but there was no change detected in core body temperature. With carbonated water bath, the carbonic acid stimulation upon the skin surface influenced a rise in body temperature, resulting in a significant rise in core body temperature.

Blood pressure and fingertip pulse values showed a significant decrease as a result of Touch Care, and foot bathing + Touch Care. These techniques would be useful for situations when desiring to control improvement of blood flow. Because carbonated water bath did not bring about a change in blood flow, this technique could be implemented in situations where changes affecting blood circulation are undesirable. That is to say, this technique demonstrated the positive trait of maintaining temperature with no burden that would affect core body temperature.

4.3 Considerations from Face Scale Questionnaire Results

In the following order, Touch Care + foot bath, Touch Care, carbonated water bath, and footbath showed a high proportion of causing an improvement in mood, and from subjects' selection of a smiling face, an effect showing change in mental attitude was observed. It is hoped that there will be an active application of these care techniques tailored to the condition of subjects who desire to see an improvement in their frame of mind. In particular, the results suggest that through these care techniques, subjects who are experiencing a depressed frame of

mind can see an effective improvement in their mood/frame of mind, as depicted in Fig.10-13.

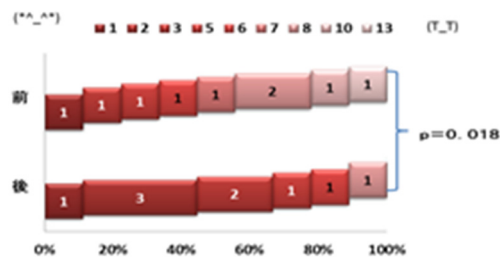


Figure 10: The change of Face scale in case of Carbonated water bath.

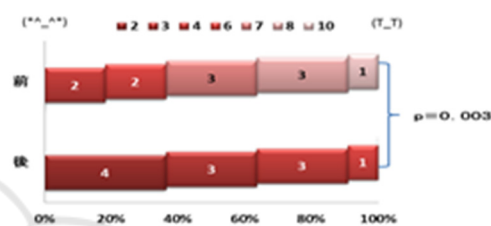


Figure 11: The change of Face scale in case of Touch care.



Figure 12: The change of Face scale in case of Foot bathing.

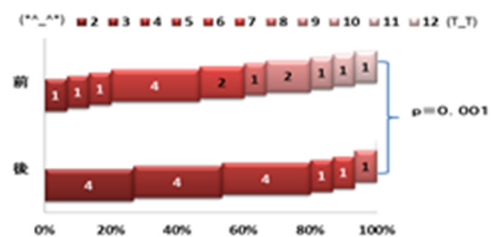


Figure 13: The change of Face scale in case of Foot bathing + Touch care.

In cases where the face scale indicated no change in mood, because physiological indicators LLE and ANB also showed no recognizable effect, the data suggest that the resulting effects of the care techniques served as barometer in revealing the mind

state of the participants. The importance of grasping the effectiveness by evaluating mood changes following the care procedures was clearly seen.

4.4 Considerations from Results of the Questionnaire (Applicable Scenarios)

The 4 care techniques had in common the following result contents that showed scenarios where useful application could be expected: support of the psychological aspect, improvement in blood circulation, improvement regarding factors involving fatigue and lack of body warmth, and aid to sleep inducement. Especially noted was that carbonated water bathing, as a care method helpful to blood circulation, was useful for bedridden subjects prone to blood clots (thrombosis), and Touch Care was effective for improvement of fluid retention (edema) in the lower legs. The research suggested the importance of selecting the optimal method of care, most fitting to the subjects' condition and vital signs.

5 CONCLUSIONS

1. From results of fingertip pulse measurements, carbonated water bathing was seen to have an approximately 80% effectiveness. Touch Care, foot bathing, and foot bathing + Touch Care demonstrated an approximately 90% effectiveness.
2. From LLE and ANB data, in care techniques that are said to have healing properties, carbonated water bathing revealed an effectiveness in activation, while Touch Care, foot bathing, and foot bathing + Touch Care showed a proportionally high level of induced relaxation, and a pattern of effectiveness was unmistakably evident.
3. In cases where there was no change in mood, effectiveness was also undetectable in results from LLE and ANB physiological data.
4. In the following order, foot bathing + Touch Care, Touch Care, carbonated water bathing, and foot bathing all showed effectiveness in mood improvement.
5. When comparing foot bathing and foot bathing + Touch Care, foot bathing + Touch Care showed a higher effectiveness in warming the body.
6. Both Touch Care and foot bathing + Touch Care showed an effectiveness in improving blood circulation, and carbonated water bathing showed an effectiveness in warming the body without altering vital signs.

From the above findings, it is considered that selection of the most suitable nursing care for each subject, as well as its application, are important. Also, regarding care that provides mental health support, for reliable construction of a direct link of that care with proper subjects, it is our desire to see that applications of these care techniques be enthusiastically applied in both clinical settings and in everyday life.

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