

The Process of End-of-life Cancer Patients Making Meaning in Continuous Purposeful Touch Intervention

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Background&Aims : One of the roles of the nurse who comes into contact with a patient at the end of life is to attend to a person who, although living, faces imminent death. Purposeful touch is an example of an active support method. This means that the nurse's act of touching is intended to help the patient become more comfortable, even if only slightly, and has the objective of mentally and physically healing the patient. To date, no studies concerning how patients experience touch have been reported. The aim of the present study was to clarify the process of end-of-life cancer patients finding meaning in receiving touch intervention. **Methods :** The study participants comprised 12 end-of-life cancer patients who underwent touch intervention by nurses for 20 minutes, two or three times per week. A semi-structured interview was carried out following each intervention, and the results of the patients' responses were analyzed according to the modified grounded theory approach. Salivary secretory immunoglobulin A (s-IgA) concentration and a visual analogue scale (VAS) on comfort level were evaluated both before and after the series of planned interventions. **Results :** End-of-life cancer patients passively accepted touch intervention, and subsequently rated touch to have value. They were also given a boost of power to live in comfort, an emotion that occurs as a result of continuous touch intervention. Finally, they experienced a series of processes to surrender to touch. No significant differences were found in IgA concentration in saliva taken before and after the series of planned interventions. The VAS on comfort level after the series of interventions was significantly higher than that before the interventions. **Conclusions :** Continuous purposeful touch intervention may positively affect patients' psychological comfort. Furthermore, patients' intentions to allow themselves to undergo touch intervention by nurses might positively affect their will to survive.

Key Words : purposeful touch, end-of-life, cancer, the modified grounded theory approach, salivary secretory immunoglobulin A concentrations

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I. Introduction

According to 2011 statistical data, 76.2% of all deaths occur at the hospital, and 87.8% of those deaths are due to malignant neoplasm¹. Many of those patients die in their hospital room.

One of the roles of the nurse who comes into contact with a patient at the end of life is to attend to a patient who is yet living, but faces imminent death. The way in which the nurse functions under such a situation is extremely important. The time left for that patient is where the limit can be seen in reality. When a patient at the end of life is close to death, the physical strength to move the body freely already appears to be depleted. Depending on how the nurse accepts the patient and how they want to provide care, the quality of interaction between the patient and the nurse changes. Nishimura² stated that, within the interacting environment, "the initiation of care work means the formation of an 'illness', and these are the same event." In other words, the way in which care is administered can affect the attitude of the patient; the patient's experience of "illness" changes according to the unconscious attitude of the nurse who is by the patient's side. The nurse must not only alleviate symptoms or ameliorate the patient's pain through the nurse's own existence, but must also actively support the patient so that they are able to face the end of life with dignity. The nurse can accomplish this by knowing that the care provided could bring peace of mind to the patient and by being involved in caring for the patient at the end of life.

Touch care is an example of an active support method. In caring for end-of-life cancer patients in a manner that reflects the philosophy stated above, support with direct touching such as stroking and massaging has been used in practice. The act of touching is to interact through skin sensation. Even in situations where verbal communication is difficult to establish, nurses can accept and acknowledge the patient's body language by direct touching and alleviate the patient's physical pain by lightly stroking, thus indicating that the nurse's intentions towards the patient can be communicated. Previous studies on touch care as a support method have shown that it eases feelings of tension and depression in hospitalized patients undergoing tests³, heightens the coping ability of cancer patients, leading to trust⁴, and transforms patients through integration of their own experience of their illness. This includes treatment by

regularly conversing with and massaging advanced stage cancer patients⁵. However, the process of how patients feel about touch care is not clear. Palliative care is the mainstay of end-of-life treatment, and elucidating the significance of the effects of touch care may aid in improving palliative care. In addition, studies have been conducted on how end-of-life cancer patients live with pain^{6,7}. Mizuno⁷ stated that end-of-life cancer patients require active and effective involvement of the nurse, and these patients are ready to accept their cancer treatment as something having validity. Furthermore, the central elements of end-of-life cancer patients' motivation in life on the general ward are to discover joy in everyday living and to feel better. Specifically, touching, such as wiping the patient's body, has been elucidated as nursing care that feels good⁸. The central nervous, endocrine, and immune systems are associated with a neurochemical network when positive emotions are elicited⁹. As described above, nurses' touching of patients while conducting daily life assistance has been shown to be a pleasant stimulus that causes positive feelings. However, there have been few interventional studies, and the effect of continuous touch intervention has not been verified in end-of-life cancer patients. Therefore, the aim of the present study was to clarify the effect of touch care in end-of-life cancer patients.

Purposeful touch is the intentional physical contact with the patient by the nurse with the intent of helping¹⁰. Previous reports have indicated that tactile stimulation, such as slow stroking, stimulates unmyelinated C afferent fibers and arouses positive emotions^{11,12}.

The act of touching by the nurse is conducted responsively and intuitively, and it induces a deep sensory and emotional interaction between the nurse and the recipient. However, it has been reported that the priority is low in the clinical setting compared with other types of care, and the present situation is such that it is rarely shared among staff members¹³. Moreover, the future direction of touch care in nursing is dependent on the recognition of its significance and value through nurses' own experiences.

Cancer patients are often lucid until the moment they die. They are able to communicate, and desire physical pain relief. Touch care as a method of support for the purpose of reducing pain has not been investigated with regard to how the recipient experiences touch.

Nurses are able to be involved with patients by conversing with them while they are still able to do so,

and are able to discover patients' support method of choice. If the nurse knows that a certain patient prefers touch, then touch care can be selected for the patient even if they are in a state where conversation is difficult. Even if nurses are not able to ensure a patient's desire for touch care through verbal confirmation, responses through facial expressions and gestures, in addition to previous involvement with the patient, enable active acceptance of touch care.

The purpose of this study was to clarify the process of making meaning for end-of-life cancer patients in the general ward who receive purposeful touch from nurses, and to formulate suggestions on planning and practicing care that involves active touching.

II. Definition of Terms

Purposeful touch (hereinafter referred to as "touch"):

In accordance with reports by Synder et al. and others^{10,14-16}, touch refers to the act of touching by the nurse with the intent of helping the patient to become comfortable, even if only slightly, and with the objective to mentally and physically heal the patient.

Experience: This indicates experience that one becomes aware of. Here, it indicates the process of patients becoming consciously aware of touch interaction with the nurse and integrating touch into their own sensation of comfort.

End-of-life: Life expectancy that is roughly predicted to be ≤ 6 months.

III. Research Method

1. Study design

This study utilized an embedded approach of the mixed methods design. The qualitative research method of hypothesis generation was used to clarify the touch intervention experience from the perspective of patients who are at the end of life due to cancer. In addition, because touch is an intervention method that directly contacts the body, its response also appears on the patient's body. This response is considered to be a physiological index reaction that confirms that the intervention is not a strain on the patient.

2. Study participants

Participants: The study participants comprised end-of-life cancer patients in the general ward of a

university hospital who were ≥ 20 years old and determined by their physician to have an expected survival of ≤ 6 months. In addition, participants were those who satisfied the study criteria and agreed to cooperate in the study. The recruitment methods and inclusion criteria were as follows:

- 1) The purpose of this study focused on the experience of end-of-life cancer patients receiving touch. Thus, all patients who were diagnosed with cancer and determined to have expected survival of ≤ 6 months by their physician, regardless of disease progression, were considered subjects.
- 2) The study participants were patients who were informed of their disease and were able to verbally communicate at the beginning of the study.
- 3) The study participants were patients for whom the attending physician and chief nurse on the ward determined that touch would not negatively affect their symptoms.
- 4) The study participants were patients who were introduced by the chief nurse on the ward and for whom permission to participate was obtained from the attending physician.
- 5) The researchers obtained written, informed consent from each study participant after orally explaining the purpose of the study.
- 6) The researchers gave similar explanations to the patients' families, and the consent of each family was also obtained.

3. Intervention method and procedure (Figure 1)

Touch method: Twenty minutes of touch, including holding the patient's hand, stroking, and pressing, was performed by the nurse. The site of touch was where the patient desired, and if the patient did not have a specific desired site of touch, touching the lower back or legs was suggested and performed with consideration of the fact that the patients are confined to bed for a long time. When nurses were performing touch, they were "there" and truly present with the patient, instilling the nurses' own feelings that they "want to be there together" with the patient. This touch included being close to the patient with the feeling of wanting to share that time with the patient. We employed these measures in consideration of the patients' families.

The person who performed touch was a nurse with experience working at a cancer hospital and was a researcher who had learned the procedures of massage

and shiatsu by regularly attending workshops. Because it was anticipated that the participants would be spending the rest of their short remaining lives in an unstable condition, the researcher conducted the intervention in such a manner as to minimize the patients' burden in participating in the study.

Dates: Upon consulting with the participant, intervention was performed at a frequency of 2–3 times per week in the afternoon.

Location: Intervention was performed at the patient's bed in the hospital room. Privacy was provided with curtains if the patient was in a room with multiple patients.

Procedure

- 1) A visual analog scale (hereinafter referred to as "VAS") for rating the patient's comfort was asked to be filled out, and a saliva sample was collected. Measurements were conducted before and after every touch intervention. A cylindrical sponge 3 cm in length and 1 cm in diameter was placed in the mouth, and saliva was collected using a saliva collection tube (Sarstedt K.K., Tokyo, Japan).
- 2) The touch intervention was performed for 20 minutes.
- 3) Immediately after the intervention, the patient was asked to fill out the VAS, and a saliva sample was again collected. A semi-structured interview was subsequently conducted.
- 4) The intervention was repeated at a frequency of 2–3 times per week.
- 5) The end point of the intervention was when the patient left the study participating ward for reasons including death, discharge, and transfer. The number of touch interventions and durations were not uniform among the study patients.

4. Measurement tools and evaluation methods

Evaluations were conducted via non-invasive and convenient physical responses and via words of the patient as a subjective response.

1) Biological reaction of the body to touch

(1) Salivary secretory immunoglobulin A concentration (hereinafter referred to as "s-IgA")

s-IgA, an index that is known to be useful for evaluating pleasant/unpleasant emotions¹⁷, was used. Saliva samples were processed via centrifugation and freezing, and sent to SRL, Inc. (Tokyo, Japan) for analysis. No restrictions were placed on eating

and drinking prior to collection.

(2) VAS related to comfort

Evaluation was conducted before and after every touch intervention. The scale ranged from 0 to 100, with 0 indicating "does not feel good at all" and 100 indicating "feels extremely good." The participants were asked to place a dot to the left or right of a line on the scale to indicate their corresponding feeling. The researcher wrote down the responses if the participants were unable to do so themselves.

2) Semi-structured interview

After every touch intervention, a semi-structured interview was conducted using an interview guide.

The content of the interview guide was reviewed in accordance with the study objective, and comparisons were made before and after each touch intervention with regard to content that changed and the meanings of those changes. The interview asked about items such as "changes before and after stroking" and "changes from the first day with regards to the perspective, sensitivity, and perception of things as well as relationships between things." Consideration was given to the setting to enable the participant to talk freely. In addition, in response to the participant's facial expressions or stammering, the researcher asked the participant about the touch intervention, and encouraged the participant to verbalize his/her experiences. The interview duration was adjusted according to the participant's condition. The interview was recorded with permission using an integrated chip (IC) recorder, and a transcription was created and used as data for analysis.

5. Analysis method

1) s-IgA and VAS

Before- and after-intervention values were paired. Data that could not be paired were excluded. The Wilcoxon signed-rank sum test was used for analysis, which was conducted using Excel 2010 (Microsoft Japan, Tokyo, Japan) with add-in software Statcel 3 (OMS Ltd., Tokorozawa, Japan). $P < 0.05$ were considered statistically significant.

2) Analysis of interview content

The modified grounded theory approach (hereinafter referred to as "M-GTA") was used to analyze the interview content. M-GTA is appropriate for hypothesis generation and can analyze complicated and subtle human phenomena that cannot be sufficiently

captured by comparison between people. Studies where M-GTA is appropriate include those involved with social interactions, human services, direct human-human interactions, and those with personality process-specific phenomena as study targets¹⁸. The objective of the present study was to understand, from the patients' perspective, the experience of end-of-life patients who repeatedly receive touch from nurses. The theoretical construction of these phenomena can allow them to be applied in similar clinical support situations; thus, M-GTA was used. "End-of-life cancer patients receiving purposeful touch" was set as the analytical target, and the "process of experience of end-of-life cancer patients who repeatedly receive purposeful touch" was set as the analysis theme.

The analysis procedure was as follows:

- (1) Data on the first participant, with extensive details, were selected, and related content was extracted according to the analysis theme. These focused data were considered as specific examples. These specific examples were interpreted to determine what they meant to the analytical target. Subsequently, the meaning was given a name, and concepts were generated. At this time, the name of each concept and its definition, specific examples, and perspective of analysis were written as theoretical notes and then summarized into an analysis work sheet.
- (2) Data were viewed from the aspect of the concepts that were beginning to form, and specific examples similar to existing concepts were added to the analysis work sheet. The meanings of specific examples that were opposite or dissimilar to the analytical targets were interpreted, and new concepts were generated.
- (3) Furthermore, with considerations for the possibility of similar or opposite concepts, the relationships between concepts were illustrated and examined. The second participant and beyond were analyzed using a similar procedure.
- (4) We investigated the relationship between concepts and generated multiple categories that encompassed multiple concepts. Concepts that could not be grouped into categories were left as concepts, and were considered to have equal explanatory power as categories. Furthermore, core categories that included several categories were generated.
- (5) We investigated where within the experience of repeatedly receiving touch the generated categories,

concepts with equal explanatory power as categories, and core categories were positioned. We also investigated how this process explained the types of movements, and created a diagram that comprehensively described those relationships.

6. Ensuring the reliability and validity and believability of the analysis:

Each interview was verified as much as possible such that the participant's speech content was accurately reflected. Moreover, when the interpretation was in doubt, questions were asked to confirm the analysis results of the previous interview. This process was repeated in order to enhance the validity and reliability of data interpretation by the researcher. Additionally, in order to further enhance the validity and reliability of the analysis, guidance was given at the step of concept generation of the first participant with extensive details by a professional experienced in qualitative research of cancer nursing. Throughout the entire analytical process, the experienced qualitative researcher perused, extracted, and interpreted the transcription, ensuring believability.

IV. Ethical Considerations

This study was conducted with the approval of the ethics committee of the institution where the participants were hospitalized (Approval number: GU07031). The purpose, methods, and overview of the study, as well as publication of the results, were verbally explained to the patients and their families, together with the use of written documents. Furthermore, the patients and their families were informed that the patients could withdraw from participating in the study at any time, and that there would be no penalties in doing so. Written consent was obtained from those who agreed to cooperate in the study.

The participants were at the end of life; therefore, their conditions could easily change, both mentally and physically. Thus, the researcher observed the condition of the participants, particularly during the interventions, and closely observed the participants to make sure they were not being stressed by the interventions. In addition, the researcher conducted the study by consulting with and reporting to the attending nurse of each patient.

V. Results

1. Background of research participants and summary of intervention (Table 1)

Of the 16 patients who were introduced by the chief nurse on the ward, three were excluded from the study: two who did not agree to the study and one whose family did not agree to the study. The remaining 13 patients became the research participants. Of these, one was excluded because data could not be obtained as they died a week later. Therefore, the final number of participants for analysis was 12 (Participants A–L). Participant L had diminished consciousness at the second intervention, and died on the 4th day of study participation before data could be collected. Consequently, data from only the first intervention of this participant is included in the analysis.

The period and number of interventions were: maximum of 7 interventions in 25 days (a survivor), 9 interventions in 19 days (Participant H), and minimum of 1 intervention. The number of described interventions was 50, excluding interventions where data was not collected due to decreased consciousness. Five participants died within a week after the final intervention.

2. Biological reactions to touch

1) Changes in s-IgA before and after intervention

(Figure 2)

Of the 50 described interventions, the total number available for analysis was 40 as a result of sometimes not being able to collect saliva due to the participant's physical condition. In 16 of these s-IgA measurements, the s-IgA concentration was elevated after intervention compared to before intervention. Before intervention, the concentrations were: maximum, 7108.9 µg/ml; minimum, 78.5 µg/ml; and median, 810.15 µg/ml.

After intervention, the concentrations were: maximum, 5068.9 µg/ml; minimum, 56.0 µg/ml; and median, 997.9 µg/ml. No statistically significant differences were observed in s-IgA concentrations between before intervention and after intervention ($p=0.30$).

2) Changes in VAS before and after intervention

(Figure 3)

Of the 50 described interventions, two (in two patients) did not show changes, and five (in three patients) showed changes toward feeling worse after intervention compared to before intervention. The other 43 showed changes toward feeling better after intervention

compared to before intervention. Before intervention, the values were: maximum, 98 mm; minimum, 0 mm; and median, 39 mm. After intervention, the values were: maximum, 100 mm; minimum, 29 mm; and median, 85 mm. VAS was significantly higher after intervention compared to before, indicating that the participants felt better after the intervention ($p<0.001$).

3. Process of the experience of end-of-life cancer patients who receive repeated purposeful touch intervention (Figure 4)

Twenty-three concepts were generated. Of these concepts, 21 that were similar in semantic content generated seven categories. The remaining two concepts had equal explanatory power as categories. Furthermore, two core categories were generated from five categories, and one concept had equal explanatory powers as categories. Figure 4 shows a comprehensive diagram that depicts these relationships as a process of the experience of end-of-life cancer patients who receive repeated purposeful touch intervention. Here, « » represents core categories, { } represents categories, [] represents concepts that had equal explanatory powers as categories, and < > represents concepts. The story line of the process of the experience end-of-life cancer patients receiving continuous purposeful touch intervention is as follows:

Touch was proposed to the participants by the researcher; the participants received this offer in two ways: <half in doubt> and as a <life-saver>. However, both parties began with the agreement that they would {try to receive touch care for the moment} because of their <desire to get rid of discomfort>. Then, by receiving touch and confronting the reality of having cancer, the patients felt good both mentally and physically and showed that they «value touch», signifying an early response.

This indicated that touch {feels good} but also forced {re-recognition of the reality of having cancer} as well as {make meaning in touch} for themselves. Participants «value touch» and developed a [hope to receive touch many times], signifying a mid-term response that the «comfort of touch boosts the power to live».

Repeated intervention caused patients {to rest with touch}, to interact with the person performing touch, and {to become aware of the connection to support}, leading the patients to have the determination to [reflect upon and face oneself living with cancer], also for the sake of those around them. During the time when patients could replenish their energy to live by {to rest with touch}, they

spent their days in cycles, back and forth with the [hope to receive touch many times]. However, with the progression of disease, if {to rest with touch} alone was not enough to replenish their energy, they experienced {to surrender to touch}. The final response was to receive touch with the feeling {to become aware of the connection to support}, and the experience was repeated until lowering of consciousness as a sign of death.

Next, we will define the two core categories and seven categories that were generated, as well as the two concepts that had equal explanatory power as categories. Specific examples are described using the patients' words. Quotation marks (“ ”) indicate a portion of a patient's words that was re-worded such that the meaning was not lost. Parentheses () at the end of each quote contains the symbol for the respective participant.

1) {Try to receive touch care for the moment}

{Try to receive touch care for the moment} indicates that the patient shows interest in the suggestion of touch by the researcher, even though the patient does not know what it is or what kind of effects it might have.

This category was generated by three concepts with similar meanings. Although the participants were interested in touch, it was unknown to them and caused anxiety. Thus, the patients were {half in doubt} with regards to the effects of touch. In addition, although they believed in the effects of touch and had been receiving touch from their family members, the patients were not completely satisfied with it. Thus, it was viewed as a {life saver} when the patients were requested to cooperate in this study. Both parties had the {desire to get rid of discomfort} by improving their pain and unrest with touch. In this manner, the participants reached the decision to receive touch.

“Honestly, I asked for it thinking that it would be nice if such pain is alleviated by receiving a massage.” (Participant B)

2) «To value touch»

Although the participant {feels good} by receiving touch, they also confront the {re-recognition of the reality of having cancer}. Along with these two categories, the process to {make meaning in touch}, in which the participant evaluates touch for him/herself, forms the core category «to value touch».

(1) {Feels good}

{Feels good} indicates the awareness of comfort and calmness of mind immediately after receiving

touch.

This category was generated from 3 concepts with similar meanings. When participants receive touch, they suddenly feel good, and become simultaneously aware of a concentration of {good feeling that occurs instantaneously} for the duration of receiving touch, and unpleasant {symptoms abate}. Moreover, the participant would {relax both mentally and physically}, becoming free of both physical and mental constraints. The participant subsequently feels calm.

“I've always hated feeling discomfort, but right now, I feel very comfortable. I feel calm.” (Participant E)

(2) {Re-recognition of the reality of having cancer}

{Re-recognition of the reality of having cancer} indicates that the participant understands that even though they feel better with touch, their illness is not cured.

This category was generated from two concepts with similar meanings. Participants were coping, but they felt that it was {difficult to return to daily life as it was before}. They were aware that {the fact remains that they have cancer} and that, in reality, they could not change the fact that they had cancer.

“I wonder how heavenly it would be if I weren't ill and felt really good.” (Participant J)

(3) {Make meaning in touch}

{Make meaning in touch} indicates that the participant recognizes the value of touch for him/herself.

This category was created from four concepts with similar meanings. Participants described their experience of {feels good} as {surprised that symptoms eased} when their unpleasant symptoms alleviated more than expected by touch, and that it was {comforting that pain is gone when I noticed}. These concepts signified that the participants felt better after some time compared with during or immediately after touch, and that noticing that they had forgotten about the pain was a good condition and made them happy. This meaning also included {comfort of having things done by others}, in which it felt better and was more effective to be touched by another person rather than by themselves or a machine. This is because there is communication with another person, and {it is better to do something than not doing anything}; it is better to be comfortable, even if it is only a little bit.

"It's somewhat nice if I feel better even if it is just at that moment. It is far better than not having anything."
(Participant E)

3) [Hope to receive touch many times]

The participants continued to receive touch with anticipation from previous experience that it would improve their condition compared to the present, even if it was by a small amount.

"I have a sense of anticipation in my head that it feels good. And I wish my appointment time was sooner. (Partially omitted) I'm filled with anticipation. So I feel that maybe it's disrespectful to have so much anticipation, but I have this image that they are truly magical hands for me right now." (Participant H)

4) «Comfort of touch boosts the power to live»

The core category «comfort of touch boosts the power to live» was formed and included the interaction with the touch practitioner or the participants {to become aware of the connection to support} through {to rest with touch}, as well as the process of becoming determined to [reflect upon and face oneself living with cancer] for the sake of others around the participants.

(1) {To rest with touch}

{To rest with touch} indicated that receiving touch had become a restful time, provided that the participant evaluated and valued touch.

This category was generated from four concepts with similar meanings. Being able to live as usual, even a little, was considered to be ⟨joy of being able to spend an ordinary life⟩, and the participants would ⟨gently speak of events they were reminded of⟩ while receiving touch. The participants would ⟨look forward to days of continuing to receive touch⟩ by feeling better both physically and emotionally, while the ⟨will to live emerges⟩, enabling them to rest and take a break.

"If I'm not in pain, then feelings like the will to live emerge, as expected." (Participant C)

(2) {To become aware of the connection to support}

{To become aware of the connection to support} indicates that the participants, who were expending all their energy just to live, were able to show an interest in the people surrounding them by being able to rest through touch.

This category was generated from two concepts with similar meanings. ⟨Reliable family⟩ refers to the realization of the dependability in having a family who will do everything they can for the patient.

Additionally, the participants expressed gratitude towards people who cared about them by accepting their feelings, requesting the deepening of their relationships, and experiencing being ⟨grateful to those who are close and consequently find peace⟩ within such a setting.

"Gratitude and love. I learned those. Up till now, I've dealt with my daughter or my wife just ordinarily. But now that I'm in this state, I think that the feeling of gratitude is created from somewhere. I'm also impressed and touched that I realized this myself. Even so, I wished I'd realized sooner. Since you've been coming, I've had an inkling. But I didn't realize I could say it so clearly like I did today." (Participant K)

(3) [To reflect upon and face oneself living with cancer]

[To reflect upon and face oneself living with cancer] indicates the inspiration to persist for the sake not only of the participants themselves, but also for those who care about them.

"This isn't about being cured or not. This feeling of gratitude will not fade for a lifetime. I want to repay my wife for all that she's done for me. But she says, it's ok, just get better. That makes me even happier. So I feel that I have to get better. Because I'm facing this mentally, I have his feeling that I'll do my best to persist." (Participant H)

5) {Surrender to touch}

{Surrender to touch} indicates the condition in which the patients accept the thoughts of those who care about them and receive touch within such a peaceful environment.

This category was generated from three concepts with similar meanings. When the participants were touched, it made them feel good, calm, and sleepy, as indicated by the concept ⟨I want to fall asleep during receiving the touch⟩. In addition, touch felt good when their condition was not well and they felt ⟨comfort of spending time gently⟩ in a reality that was ambiguous and fuzzy, but comfortable. However, even though the participants could respond, conversing was difficult and tiresome, indicating their experience that ⟨it is difficult to think and speak⟩.

"I feel very calm. I'd feel even happier if I could continue to quietly sleep for a little while." (Participant E)

VI. Discussion

1. Energy that touch induces in end-of-life cancer patients

The energy that touch care induces in end-of-life cancer patients is discussed from the following two aspects: 1) Touch as physical contact; and 2) touch as interaction.

1) Touch as physical contact

With regards to touch, the participants of the present study indicated that they would {try to receive touch care for the moment}. In a study of people who live in a down-phase while receiving cancer treatment, Amano et al.¹⁹ found that exploring ways to obtain peace is one of the properties of self-healing. The participants of the current study were in a state of having the <desire to get rid of discomfort>, and the suggestion of touch by the nurse appeared to have moved them.

Touch as performed in the present study primarily used a method of lightly rubbing. Light mechanical stimulation to the skin stimulates its low-threshold mechanoreceptors, and is known to induce analgesic effects by generating low frequency neural activity²⁰. End-of-life cancer patients are in a difficult situation in which their conditions change daily. Therefore, intervention that leads to pleasant stimuli resulting in a comfortable and good feeling is important. Touch induced pleasant emotions in the participants of the present study. This was also evident from the significant elevation in VAS related to comfort after intervention compared to before intervention. In addition, the resulting VAS from qualitative inductive analysis (Figure 3) also showed that {feels good} was generated as a category. These results were considered to signify that touch was accepted as an emotional experience of subjectively feeling good.

Touch also forced the {re-recognition of the reality of having cancer}. However, this can be interpreted that the response of {feels good} surpassed this, and prompted patients to {make meaning in touch}, leading to pleasant emotions. Regarding biological reactions to touch, no statistical differences were found in s-IgA before and after intervention; however, the median value increased after intervention compared to before intervention. It has been reported that 10 minutes of back massage significantly increases s-IgA in healthy elderly people²¹. In addition, while 20

minutes of leg massage increases s-IgA, it has been reported that the increase in cancer patients is less robust than in healthy subjects²². The participants of our study were in the end-of-life stage; therefore, since each participant had an immune system that was in the process of resisting disease, and their biological defense mechanism against cancer or a non-self cell population was active, their weaker response to massage could be predicted. It appears that statistical differences were not observed due to large individual differences in the changes in mental and physical state, and also due to the small study population. These results suggest that, at the very least, touch was not an unreasonable intervention for the participants.

{Create meaning for touch} includes how the participants evaluated touch. The four concepts <surprised that symptoms eased>, <comforting that pain is gone when I noticed>, <comfort of having things done by others>, and <it is better to do something than not doing anything> included in this category represent a property of touch that the end-of-life cancer patients recognized. This is a new finding. Some studies have used the concept of “meaning” for the psychological adjustment of cancer patients²³. The “meaning” is “how to continue living like oneself while dealing with having cancer”. Making meaning affects psychological adaptation and is related to [Re-recognition of the reality of having cancer]. In this study, we considered that patients found meaning in the context of their cancer.

Touch as physical contact induced pleasant emotions, along with the alleviation of unpleasant symptoms. This became a trigger <to value touch>, leading to <comfort of touch boosts the power to live>. As a result, touch seemed to inspire the will to live.

2) Touch as an interaction

{To rest with touch} means to take a break from unpleasant symptoms or anxiety, and this can be captured as an experience that replenishes the energy to live. End-of-life cancer patients found massage to be a treatment that was compassionate. This is currently receiving interest²⁴, and it has been reported that, by obtaining a calm sensation, patients can experience existential inner rest time. Our results also supported this. Parse²⁵ stated that, after direct involvement, nurses remain and stay for a long time, living in the patients' memories. She also stated that this is one of the ways a nurse can truly be present with the patient (True

Presence). The fact that (gently speak of events they were reminded of) was generated as a concept signifies that the patient was able to live the memories “of that time” through touch, in which the practitioner was being truly present with the patient.

In addition, {to rest with touch} indicated a phase extended to others, such as an interest {to become aware of the connection to support} apart from themselves. It has been reported that a positive connection between end-of-life cancer patients and the people surrounding them gives the patients strength and encouragement that inspires the will to live²⁶. The findings of that study were similar to those of the present study. While the study population was different, Henricson et al. also reported similar results²⁷, signifying experience connecting to reality and to others. This appears to have increased the patients’ energy, prompting their determination [to reflect upon and face oneself living with cancer]. This determination can be interpreted to signify the patients gaining insight into their existence through relationships with significant others and aiming to face the present condition and be themselves. Finally, this corroborates the observations by Hirooka et al²⁸ in their study that reflected on the experiences of self-support in terminal stage cancer patients.

[Hope to receive touch many times], {to rest with touch}, {to become aware of the connection to support}, and [to reflect upon and face oneself living with cancer] were shown to have cyclical relationships. Participants had initially started receiving touch due to their (desire to get rid of discomfort). However, this eventually changed to a method to replenish their energy to live through interaction with others, suggesting that it aids in reflecting on one’s existential inner self.

Finally, the category {surrender to touch} was generated. It was thought that repeated touch also became a place where participants could be themselves and a place where they could acquire the driving force to survive.

2. Significance of touch in end-of-life patients, and proposal/suggestion for its practice

People close to death spend the rest of their limited time in a limited place. Touch care by nurses that considers the comfort and needs of patients is already used in practice clinically, and our study elucidated that it

induces pleasant emotions and provides patients with the power to live. Mizuno⁷ reported that, in order for end-of-life cancer patients to continue thinking that they can live, it is important to encourage an environment where they can experience as much sense of comfort as possible. Our results support this report.

With the objective of relieving cancer pain, nurses have been performing massage movements for patients such as stroking and kneading. It has been reported that the effects of such practice are recognized as promoting the sensation of feeling good, reducing anxiety, relieving pain, and deepening trust with patients²⁹. Our results suggest that patients do approve of this, and that repeated touch also boosts their will to live. Purposeful touch is a supportive intervention that represents “to attend to the patient who is trying to live until the end—to truly be present with the patient (True Presence).” For this reason, it is desirable for nurses to repeatedly carry out touch intervention.

In addition, it has been elucidated that touch can evoke communication with significant others. Family members who take care of an end-of-life cancer patient at home can interact with the patient by listening to his/her old stories or words of gratitude towards them, and by touching the patient. This is known to induce positive emotions and recognition³⁰. These findings suggest that touch is an effective support method that creates an opportunity for promoting interaction, not only for medical professionals who attend to end-of-life cancer patients, but also for their families. Family members are searching for things they can do to help the patients. Nurses can suggest that they incorporate touch care.

VII. Limitations and Future Directions of This Study

The patients who participated in this study were those who did not object to being touched by a researcher, as determined at the first meeting when the patients consented to participate in the study. Moreover, the researcher who conducted the touch intervention was also the interviewer; consequently, there may be a bias in the results. In the future, we plan to investigate patients who receive touch, not from the researcher, but from the nurse who clinically comes into contact with the patients on a daily basis. The subsequent results will be used to verify and modify the original study.

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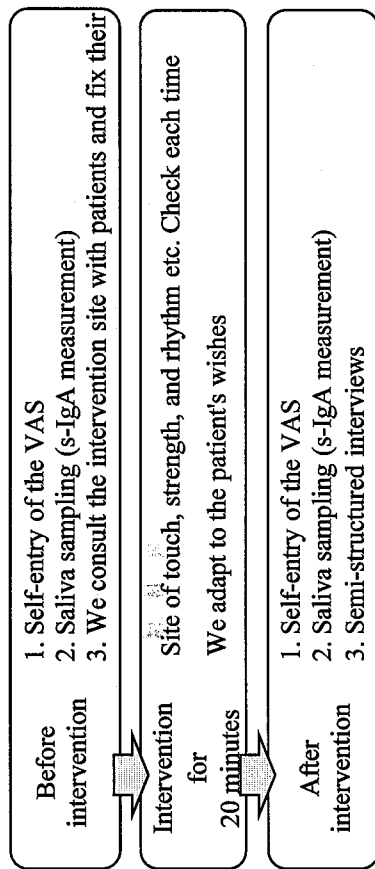


Figure 1 Interventional procedure

Table 1. Background of research participants and summary of interventions

Identifi- cation	Age group	Gender	Number of interventions	Site of Touch	Clinical Course	Time between final intervention and death (Days)	Time between initial intervention and end of study participation (Days)
A	60s	Male	7	lumbar area, legs, bottom of feet	Died (after discharge)	9	18
B	70s	Male	2	lower back	Died (at home after re-hospitalization) (during re-hospitalization at another hospital after discharge)	54	3
C	70s	Male	3	arms, shoulders, precordial area	Died (at home)	60	8
D	50s	Male	5	abdomen	Died (at home)	4	15
E	50s	Male	3	back, neck	Died (during re-hospitalization after was receiving home care and nursing visits after discharge)	42	8
F	70s	Male	3	lower back	Unknown	unknown date of death	24
G	50s	Female	2	back, forearm legs, bottom of feet,	Died (at home)	5	5
H	50s	Male	9	lower back	Died (Discharge at death)	4	19
I	30s	Female	3	flank region, legs	Died (Discharge at death)	2	7
J	60s	Female	5	abdomen left shoulder, back,	Died (after transfer to PCU)	16	14
K	80s	Male	7	lumbar area	Survived (discharged after transfer)	home	25
L	50s	Male	1	legs, bottom of feet	Died (Discharge at death)	4	4

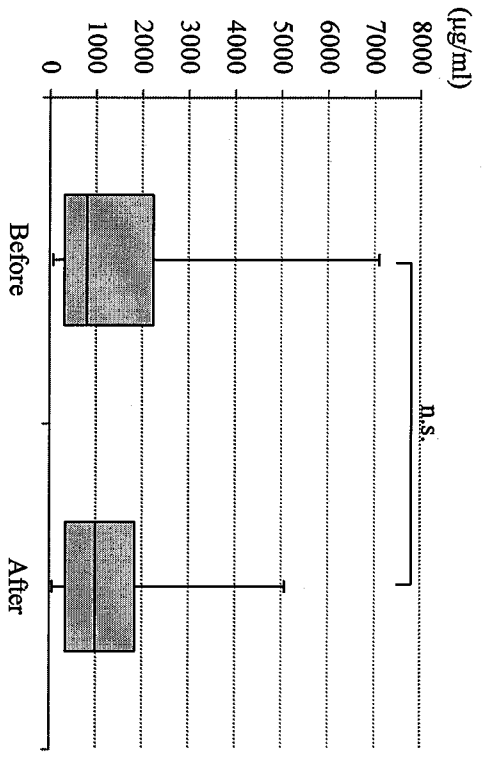


Figure2 Changes in s-IgA before and after intervention
 Cumulative total data = 40
 Line, Median; box, 25-75%; whiskers, maximum and minimum;
 n.s.: not significant, Wilcoxon signed-rank sum test

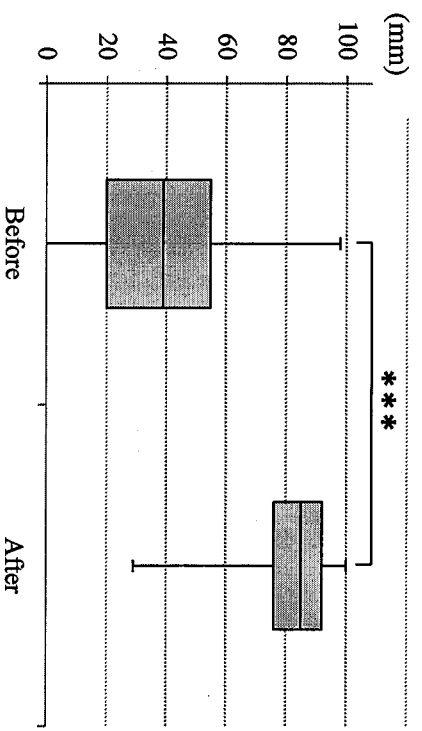


Figure3 Changes in VAS before and after intervention
 Cumulative total data = 50
 Line, Median; box, 25-75%; whiskers, maximum and minimum;
 ***p < 0.001 Wilcoxon signed-rank sum test

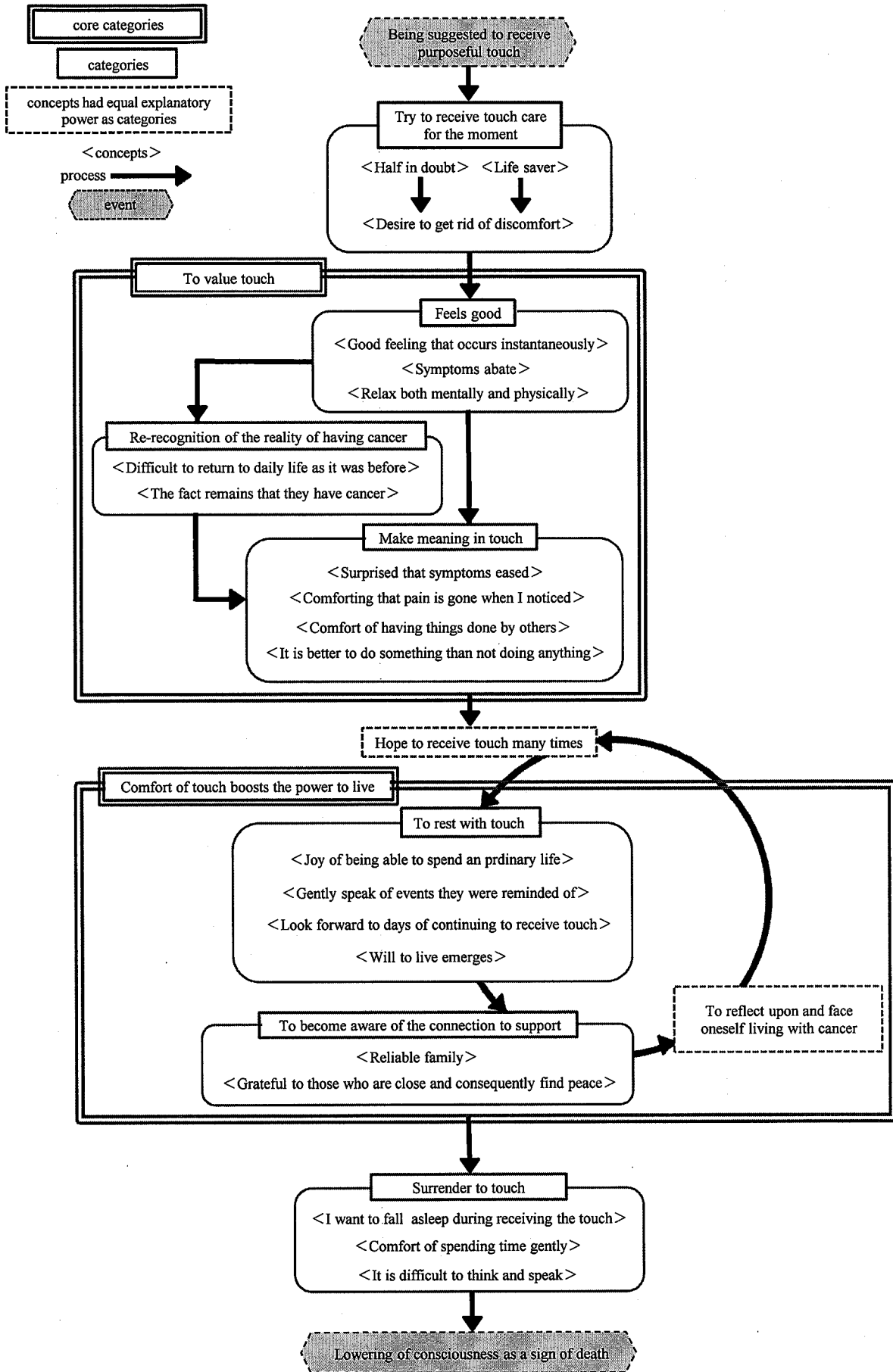


Figure4 Process of the experience of end-of-life cancer patients who receive repeated purposeful touch

