

Abstract

Nursing

SCHEDULE

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ALTERNATIVES TO THE FAMILY IN NURSING CARE: A STUDY OF TENSIONS FACED BY NURSES DEALING WITH POSSIBILITIES AND IMPOSSIBILITIES

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Introduction

The re-conceptualization of the family is currently being actively debated in fields such as sociology, politics and feminist research, with a focus on care, which is an important function of the family. Focusing on this function of the family in care, this study is an attempt to examine the clinical practice of nurses providing care to patients instead of their families, identifying areas in which nurses can serve as an alternative for families, and areas in which nurses are not able to serve as an alternative for families. This research is expected to clarify issues around how nurses define family and how they explain family, and re-conceptualize the family ex-post facto. Through this re-conceptualization, the paper contributes to thinking about relationships between people and about concepts of family not constrained to existing notions of blood relations, official family registers, cohabitation and sexual love.

Aim

To identify the ways in which nurses perceive families, with a focus on tensions described by nurses in the possibilities and impossibilities of serving as an alternative.

Methods

Participants, data collection and analysis: Ten nurses employed in the neurological center of a regional medical care support hospital were interviewed individually in detail regarding clinical family nursing practice on two occasions, each lasting approximately one hour. Interviews were recorded using an IC recorder, and verbatim transcripts were created after the interviews finished. Based on the transcripts, the ways nurses explained families in the practice of nursing care were recorded.

Data collection period: July 2011 – January 2012

Ethical considerations: The study was conducted after obtaining approval from the University of Shizuoka Research Ethics Committee. Nurses' participation in the study was completely voluntary, with participants recruited through a request posted in wards. Each research participant was provided with both oral and written explanations of the study protocol and gave consent before participating in the study.

Results

Elements of support for daily life for which the nurses could serve as alternatives were related to physical and practical matters. It was possible for nurses to serve as an alternative in some emotional and psychological matters, but they recounted that this was not possible in many aspects. However, there was no clear distinction between the two, and the issue of which elements it is possible to serve as an alternative and which elements it is not possible was a matter of "patients deciding" and "nurses finding areas in the relationship with patients and their families", that is, the care of patients was implemented in a mutually complementary way by families and nurses. When nurses talked about possibility/impossibility of serving as an alternative, they

conceived "family" as a continuous relationship and place to be and as the sharing of time from past to present to future, where the patient could have the security to be a patient. They explained that, if these conditions were satisfied, unmarried partners, friends and acquaintances could be "family", regardless of blood relations, cohabitation or official family register.

Examples nurses gave of being unable to serve as alternatives, which applied not only to nurses but to all parties outside the family, were economic matters and proxy decision making when patients were no longer capable of making decisions themselves (particularly decisions regarding life, for example, prolongation of life and gastrostomy, decisions about place of treatment after hospital discharge, signing of consent forms for surgery and tests etc.). When talking about the impossibility of serving as alternatives, nurses explained blood and legal ties as "family". Nurses had to be involved with families in regard to economic matters and proxy decision making, and experienced this as a source of tension in cases where patients had been estranged from their family for a long time, or where families did not get along well even if they lived together, or where families were not really interested in the patient.

Discussion

Through everyday nursing practice, nurses develop an awareness of the kind and extent of care that will be required from other people after patients are discharged from hospital, in order for them to live in society. This may account for why nurses explain "family" as "people who provide support to live", as they express concern for patients embarking on daily life with disabilities or illnesses. However, in terms of economic matters or cases where proxy decision making concerning life has to be undertaken, blood and legal ties become "family". In everyday nursing practice, nurses do not perceive family merely in legal or economic terms. Nonetheless, it is a fact that in Japan, intimacy has been reduced to the family to an excessive degree because of the legal and economic protection of the family system, leading to a situation whereby the burden of care very often ends up being placed on the "family" of blood and legal ties (Saito & Takemura, 2001). Nurses' mode of practice in conceiving "family" as "people who provide support to live", beyond the legal and economic framework of the family, may provide a hint to consider new "relationships between people" that place the patient at the center. If the family is perceived in this way, it may be possible to lighten the burden on care providers, who have often been alone and most often been women in the traditional unit of the family as a couple of opposite sexes. Moreover, the practice of nurses creating "connections" between patients and people who provide support to live leads to a situation in which patients and families are not locked into a "family", but always have someone else to respond.

The participants in this study were nurses working at the neurological center, dealing with patients who needed care in various aspects of daily life due to disorders and disabilities,

many of whom had difficulty in independent decision making. Consequently, the tensions experienced by these nurses may be specific to neurological centers. However, it is considered that these nurses' tensions could have important implications for various problems involving families in contemporary society in Japan, such as abuse of children and elderly people, and solitary death.

Acknowledgements

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Hypoglycemia simulation performance evaluation for nursing students using the Lasater Clinical Judgment Rubric tools

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Introduction

Hypoglycemia is known as one of the most common complications in patients with diabetes. In the case of acute hypoglycemia, lack of emergency managing can lead to death, bodily dysfunction and psychosocial disorders [1]. For managing those emergency clinical situations, nurses need to learn how to manage or provide nursing intervention to the patients through clinical judgment [2]. However, the opportunity to learn how to manage hypoglycemia emergencies is limited in clinical practicum as a nursing student.

A simulation-based education will help to improve nursing students' skills for managing the patients with hypoglycemia by indirect experiences in the simulation situation. Therefore, researchers provided a simulation-based practice with a hypoglycemia emergencies patient scenario and assessed their simulation performance by Lasater Clinical Judgment Rubric (LCJR) [3].

The results of this study provide the basic information about nursing students' clinical judgment ability which is the indicators for the effectiveness of the Simulation-based education. The objectives of this study are as follows; (1) Evaluating the validity of LCJR. (2) Determining the reliability of the LCJR. (3) Assessing the clinical judgment ability for nursing students in hypoglycemia emergency simulations.

Materials and Methods

This study used one group posttest-only experimental designed to assess the clinical judgment ability of nursing students who received simulation-based education by clinical judgment tools with LCJR. Validity and reliability of the LCJR were tested prior to use by evaluating of item content validity index (I-CVI: 1 = very inappropriate, 4 = very appropriate) [4, 5, 6] and inter-observer reliability by experts. Experts were consisted with 8 nursing professors experienced in simulation-based training whom ensured content validity. Sixty of senior nursing students in Y University were participated to the simulation-based education and evaluated their clinical judgment ability by LCJR. In addition, Clark's instrument which evaluates the simulation performance was used for concurrent validity [7].

The video tape which was recorded during the hypoglycemia emergency simulation practicum was used to analyze students' clinical judgment ability from 2 to 4 of July 2012. All the procedures were ethically considered.

Lasater Clinical Judgment Rubric (LCJR) was consisted with 11 questions (1 = beginning, 4 = exemplary). It was composed with four sub-categories, 3 noticing questions (N1, N2, and N3), 2 interpreting questions (I1, and I2), 4 responding questions (R1, R2, R3, and R4), and 2 reflecting questions (Re1, and Re2), according to Benner's 4 levels of nursing grading scale (rubric) [3].

To improve the consistency between two research assistants who acted as the analysts, they were trained with 5 movie clips until they reached consistency value up to .80. After the training, they reviewed 55 videos to analyze means, standard deviation (SD), inter-observer reliability coefficient (Kappa) and correlation coefficient using PASW.

Results

The mean age of the participants was 22.13 years. Forty eighty (87.3%) were female and seven (12.7%) were male.

1) For validity, the value of I-CVI of the LCJR by experts was 'reasonable'. The value was more than 3.0 for all items. And the value of concurrent validity with Clark's instrument was 'reasonable'. The correlation coefficient between LCJR and Clark's was .899.

2) For reliability, the value of inter-observer consistency were $.577 < k < .836$ and $.767 < r < .914$. The results show as 'reliable'

3) The mean (SD) of the student nurses' clinical judgment was 2.04 (.50). The details are shown in Table 1.

Table 1.
Evaluation of Hypoglycemia simulation performance by LCJR
(N=55)

Item	Mean (SD)	Range	Mean (SD) for each sub-category
Total	2.04 (.50)	(1~3)	
N1	2.16 (.74)	(1~3)	2.08 (.63)
N2	2.07 (.72)	(1~3)	
N3	2.00 (.77)	(1~3)	
I1	1.96 (.61)	(1~3)	1.99 (.53)
I2	2.02 (.56)	(1~3)	
R1	2.22 (.71)	(1~4)	2.09 (.54)
R2	2.20 (.78)	(1~3)	
R3	1.98 (.76)	(1~4)	
R4	1.96 (.51)	(1~3)	
Re1	1.82 (.51)	(1~3)	1.82 (.51)

notes. N1, N2, N3: Noticing; I1, I2: Interpreting; R1, R2, R3, R4: Responding; Re1: Reflecting

Conclusions

Based on the results of this study, Lasater's clinical judgment rubric tool can be used for assessing the simulation performance evaluation for improving nursing competency of nursing students. This result provides the basic information to develop a simulation-based education program and evaluate the clinical judgment of nursing student.

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THE RELATIONSHIP BETWEEN PROFESSIONAL AUTONOMY, SELF-ESTEEM AND MORAL SENSITIVITY OF CERTIFIED NURSE SPECIALISTS IN CANCER NURSING

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Introduction

According to the medical advancement and the increase in cancer patients, specialized competencies in cancer nursing are called for. In response to these social changes, master's prepared Certified Nurse Specialist has been introduced. In order to accomplish their role as specialists, they need to function autonomously.

It was thought that seniority and current position were related to professional autonomy. However, it has become clear that what and how they learn from experience are more important for professional autonomy. Personal self-esteem and moral sensitivity may play an important role in the way of learning. Therefore, the purpose of this study is to clarify relationship between professional autonomy, self-esteem and moral sensitivity.

Materials and Methods

Subjects: We surveyed all 327 Certified Nurse Specialists in Cancer (OCNSs) (as of April, 2012) in Japan.

Requirements of OCNS certification are five or more years of clinical experience including three or more years of cancer nursing, master's degree in oncology nursing, and success in an examination conducted by Japanese Nursing Association.

A survey consisted of 75 items including 9 items for demographic characteristics, 47 items for professional autonomy, 10 items for self-esteem, and 9 items for moral-sensitivity.

Scales: Demographic characteristics included age, sex, educational background, years of clinical experience, years of experience as OCNS, sub-speciality, an affiliation, position and rank, and activity time. These items were derived from literature.

Professional Autonomy Scale was developed by Kikuchi to measure the level of autonomy of nurses in general. It is a 5 point Lykert scale consisting of 47 items of five subscales, "cognition", "performance", "concrete judgment", "abstract judgment", and "independent judgment". Total possible scores range from 47 to 235; the higher the score, the higher the level of professional autonomy.

Self-Esteem Scale (RSES-J) is a Japanese version of Rosenberg Self-Esteem Scale developed by Mimura. It measures the level of self-esteem. It has been developed based on the assumption that one with high self-esteem can understand others well, can sympathize well, and respect other's feeling and intention. Total possible scores of this 4 point Likert scale range from 10 to 40; the higher the score, the higher the level of self-esteem.

Moral-Sensitivity Scale (J-MSQ) is a Japanese version of Lutzen's rMSQ developed by Maeda. It is a 6 point Likert scale consisting of 9 items of 3 subscales, "moral strength", "sense of moral burden", and "moral responsibility". Total possible scores range from 9 to 54; the higher the score, the higher the level of moral sensitivity.

We distributed and collected this questionnaire via mail. All participants provided written informed consent.

This study was approved by Nagoya University Medical Department Bioethics Screening Committee (approval number 11-164).

Operational definitions ;

Professional autonomy: To recognize oneself as a profession, make a selection and/or decision based on one's own values and judgment, and act with responsibility, while understanding the relationship with others.

Self-esteem: A feeling connoting self-respect and self-acceptance which articulates the perception of oneself regarding one's own value and ability (or talent, competence, potential).

Moral sensitivity: A consideration to moral values and awareness of one's own role and responsibility in the situation of value conflict. Ethical sensitivity.

Data analysis: Pearson's product moment correlation coefficient was used to determine relationship among variables. Significance was set at $P < 0.05$.

Results

1) 118 OCNSs responded (response rate 39%) and all of them were valid for analyses. The average age of the respondents was 40.9 years old (SD=5.82). An average of clinical experience was 206.67 months (SD=66.461), 80% of the respondents were with less than 5 years of the OCNS experience. Most prevalent position was management (48.3%), and 27% of the respondents worked solely as Certified Nurse Specialist. Majority of the respondents (66.9%) belong to Local Cancer Hub Hospital. About half of the respondents were assigned to wards or outpatient departments, and the rest belonged to nursing administration departments or the palliative care teams. Even if they worked as general nurses as well, 22% of the respondents functioned as OCNSs in their given circumstances.

2) The average scores of the professional autonomy, the self-esteem and the moral sensitivity were 4.1429 ($\pm .42316$), 2.7102 ($\pm .45412$), and 4.5278 ($\pm .45704$), respectively.

3) The correlation coefficient between professional autonomy and self-esteem was $r = 0.319$. The correlation coefficient between professional autonomy and overall moral sensitivity was $r = 0.556$, and the "moral strength" subscale of moral sensitivity showed $r = 0.690$.

Table 1 Respondent's characteristics

Item	Average value±SD or the number (%)	
Age (range)	40.85 ± 5.867	
Sex	male/female	0/117 (0/99.2)
	no answer	1 (0.8)
The last school education	Graduate school (a master/doctor) 115/3 (97.5/ 2.5)	
Years of experience (month)	206.67 ± 66.461	
OCNS experience	five or less years	98 (83.1)
	more than 5 year	17 (14.4)
	10 years or more	3 (2.5)
	no answer	2 (1.7)
Position and rank (those with a multiple answer)	OCNS only	27 (22.9)
	management	57 (48.3)
	staff position and rank	32 (27.1)
	in addition to this (teaching profession and team devotion)	7 (5.9)
Affiliation Speciality	cancer specialty hospital	14 (11.9)
	local cancer hub hospital	79 (66.9)
	general hospital	18 (15.3)
	others (clinic, home nursing care, and educational facilities)	5 (4.2)
Activity style	OCNS only	27 (22.9)
	inpatient ward	34 (28.8)
	outpatient department	27 (22.9)
	others (consultation support section, nursing department, educational facilities, relief team, and medical-examination section)	24 (12.4)
Activity time reservation (except OCNS only n = 91)	scheduled by myself	20 (22.0)
	there is an activity day / time. generate	23 (25.2)
	during daily work	22 (24.1)
	carry out by overtime	4 (4.4)
	no answer	21 (1.9)

Table 2 Descriptive statistics of professional autonomy , self-esteem and moral sensitivity

	N	average value ± SD
professionals autonomy (PA)	116	4.1429 ± .42316
: cognition (c)	117	4.1966 ± .44527
: performance (p)	118	4.0436 ± .47683
: concrete judgment (cj)	118	4.2397 ± .50770
: abstract judgment (aj)	117	3.9805 ± .51265
: independent judgment (ij)	118	4.3763 ± .44389
self-esteem (SE)	118	2.7102 ± .45412
moral sensitivity (MS)	116	4.5278 ± .45704
: moral strength (ms)	117	4.4872 ± .81006
: sense of moral burden (smb)	117	4.3483 ± .52106
: moral responsibility (mr)	118	4.9449 ± .59479

Table 3 Correlation of a professional autonomy, self-esteem and amoral sensitivity

	PA	c	p	cj	aj	ij
SE	.319 **	.274**	.250**	.346**	.346**	.101
MS	.566**	.536**	.518**	.478**	.497**	.378**
ms	.690**	.661**	.635**	.598**	.579**	.462**
smb	.146	.153	.136	.123	.157	.027
mr	.291**	.235*	.253**	.202*	.249**	.315**

correlation of Pearson *p< .05 **p< .01

Discussion

1) Increased number of nurses who work as OCNS's role only and significant proportion of affiliation to hospitals specialized in cancer treatment indicate improvement of their working environment where OCNSs are able to demonstrate their specialized competences.

Moreover, even if they are employed as general nurses they act as OCNSs during they are performing their duty on their own.

2) All scores of total professional autonomy and its sub scales showed consistent high scores. Total score of a professional autonomy was higher than those of senior generalist nurses studied previously. It may be concluded that OCNSs possess high level of autonomy regardless of their working situations.

Moral sensitivity was also higher than those of previously studied senior generalist nurses. It is noteworthy that the average score of an item "feels very difficult to control my emotion while the patient is in pain" among the subscale "moral strength" was lower than those of previous study. This item was considered negative trait for moral sensitivity in this scale. However, the low score may indicate that OCNSs are knowledgeable enough to understand the patient and his/her circumstances and are capable in providing appropriate care to the patient without being over-involved.

3) Professional autonomy and moral-sensitivity are moderately positively correlated. A nurse with high professional autonomy is also highly moral sensitive. In particular, a subscale "moral strength" showed the highest correlation with professional autonomy. It may imply that OCNSs are able to analyze the patient's situation comprehensively and are courageous enough to advocate their patients and families.

Conclusions

1) OCNSs have been extended their activity in the organization without limiting to an assigned work places. Moreover, they have acquired positions which they can demonstrate their specialized competencies.

2) Positive weak correlation between professional autonomy and self-esteem, and positive correlation between professional autonomy and moral sensitivity were demonstrated.

3) The moral strength which is necessary to advocate a patient was related to the professional autonomy of OCNSs.

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Affecting factors on maternal role competence of mothers of premature infants : A literature review

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Introduction

The birth rate in South Korea is 1.17, the lowest in the world; however, due to development of technologies such as external fertilization and in-vitro fertilization, birth rates of low-weight infants and premature infants showed a steady increase by 4 to 10 percent from 1995 to 2005 [1]. Despite these increasing trends, as a result of development of domestic medical technology and the reality of shortening the funding period due to introduction and enforcement of the comprehensive medical fee system (DRG), mothers of premature infants are charged with the duty of caring for their premature infants without adequate psychological preparation [2].

In particular, regarding the maternal role, competence for mother-infant interaction is commonly considered the most important factor in growth and development of premature infants [3]. However, the birth of a premature infant and hospitalization in the NICU disrupts the expected development of interactive skills for both the parent and the infant [4]. Lack of this mother-infant interaction leads to adversities of maternal role adaptation. Therefore, in order to increase mother-premature infant interaction, the importance of nursing intervention for improvement of maternal role competence should be emphasized [5].

A sense of self-efficacy is defined as the recognition of self-ability as a parent, being able to parent children and to cope with the problems associated with parenting children [6]. In addition, it is also defined as the expectation of how much a parent can have an effect on the developmental results of children [7]. In order to determine a sense of self-efficacy of mothers of premature infants, it is important to evaluate the factors affecting a sense of self-efficacy. However, most previous studies focused on the relationship between mothers of mature infants or the general characteristics of the mothers in relation to parenting of children; few studies have focused on analysis of factors affecting a sense of self-efficacy of mothers of premature infants.

Thus, this study was conducted in order to provide verification of the factors affecting a sense of self-efficacy of mothers through consideration of previous studies as to a sense of self-efficacy of the mothers. In addition, the factors affecting a sense of self-efficacy of mothers of premature infants as reflecting the characteristics of premature infants are discussed. This study may be leveraged as an important source of basic information for use in development of nursing intervention for the sake of improving a sense of self-efficacy in the case of development of a discharge education program for mothers of premature infants from NICU.

Materials and Methods

Subjects: The database PubMed (provided by the US National Library of Medicine) and RISS (provided

by the Korea Education and Research Information Service) were used in the search for the following terms: maternal role competence, infant, prematurity, and premature infant in abstracts published from 1999 to the present date.

Data analysis: Among the 12 searched papers, a total of six research papers (five research papers from PubMed, one research paper from RISS) that matched the purpose of this study, to verify the affecting factors of maternal role competence, were studied.

Results

According to the study reported by Chien-Chi Liu et al., which analyzed factors affecting maternal role competence for mothers of normal mature infants, maternal confidence, infant temperament, number of maternal parity, maternal health status, and infant health status were confirmed as the significant affecting factors of maternal role competence [8].

In the study reported by Fry and Joan, emotional support, physical comfort, status of self-care, burden of infant care, information, advocacy, referral, support for infant care, support for sibling care, and household organization were the affecting factors [9].

In the study reported by Chae, breast feeding, infant temperament, and infant health status were confirmed as the affecting factors of maternal role competence [10].

In the study reported by Tarkka, targeting first-time mothers, emotion, demandingness of mother, coping with child by the mother, mother's feeling of isolation, whether the mother receives aid from a network, attachment to the child, and acceptability of mother were confirmed as the affecting factors of maternal role competence [11].

In the study reported by Holditch-Davis et al., targeting mothers of medically fragile infants, maternal identity and vulnerability of the infant were confirmed as the affecting factors [12].

Finally, in the study reported by Zahr and Cole, which verified maternal role competence and sensitivity of mothers of premature infants, mother's affective behaviors and mother's caretaking skills were confirmed as the significant affecting factors [13].

Discussion

According to the literature review of the six studies, it is possible to classify the affecting factors of maternal role competence into the factors of mother side, factors of infant side, and environmental factors.

First, regarding factors of mother side, maternal confidence, emotional status, maternal identity, number of maternal parity, health status, physical comfort, status of self-care, demandingness, acceptability, attachment to the child, and caretaking skills were the affecting factors.

Second, regarding factors of infant side, results of our analysis indicated that infant health status, vulnerability of infant, infant temperament, and breastfeeding were the affecting factors.

Finally, regarding environmental factors, information, emotional support, support for infant and sibling care, household organization, whether the mother received aid from a network, and referral system were confirmed as the affecting factors.

Interaction between premature infants and mothers is important as a way of promoting growth and development of premature infants; thereby, absolutely requiring promotion of maternal role competence. Thus, based on basic information regarding the affecting factors of mother side, infant side, and environmental side of maternal role competence, which was verified in this study, for the sake of ensuring the health of premature infants, it is believed that development of a nursing intervention program to enable mothers to achieve efficient nursing of premature infants is necessary. This may be leveraged as important information for use in development of an educational program for mothers of premature infants in the NICU.

Conclusion

This study was conducted for evaluation and analysis of six research studies, which were searched using the following key words: maternal role competence, infant, prematurity, and premature infant, in order to verify the factors affecting maternal role competency of premature infants. The affecting factors of maternal role competence were confirmed as being classified into the factors of mother side, infant side, and environmental side. The affecting factors confirmed in the results provide important information for promotion of maternal role competence of mothers of premature infants.

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ESTABLISHMENT OF NEW LYMPHATIC ROUTES FROM EDEMATOUS LIMB AFTER LYMPHADENECTOMY IN RATS

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Introduction

Secondary lymphedema is most often caused by mechanical insufficiency of the lymphatic drainage system. It leads to swelling of the extremity on the surgical side, which occurs as a result of the accumulation of interstitial fluid. Combined decongestive therapy (CDT) has been applied to mild or moderate cases in general [1]. However, the mechanism of lymphedema formation and the therapeutic mechanism of CDT and its efficacy are still unclear [2]. The purpose of the present study is to investigate lymphedema formation and progression, and to search for an escape route for excess interstitial fluid, from the aspect of fluid movement.

Materials and methods

Materials

Twelve male Wistar rats (age range, 10-14 weeks) were used. All *in vivo* experiment protocols were reviewed and approved by the Animal Experiment Committee of Nagoya University.

Procedures

During surgery, rats were anesthetized with isoflurane inhalation, and 0.2 ml of a 1 mg/ml solution of ICG was injected subcutaneously into the dorsum of the right paw and both the medial and lateral ankle to detect lymph nodes in the groin and lymph vessels in the femoral area. After normal lymph flow was confirmed by the photodynamic eye system (PDE: Hamamatsu Photonics K.K. Hamamatsu, Japan). A circumferential incision from a surface of skin to subcutaneous tissue was made at the right groin. Lymph nodes in the right groin and the ipsilateral popliteal fossa were completely excised. Lymph vessels were carefully ligated under optical imaging. The skin edges were then sutured end to end by 4-0 nylon.

Evaluation of limb edema

The treated hind limb was evaluated by ICG lymphography and circumferential measurement. Both evaluations were performed at specific periods of time from the Day 3 post-surgery and ten weeks thereafter. Limb circumferences of the surgical site and the contralateral site were measured at the inguinal regions. Lengths are presented as medians and ranges. The significance of differences was assessed with the non-parametric Wilcoxon single rank test with Bonferroni correction.

Results

Preoperative image

All rats showed the same fluorescent image before surgery. On the right foot pad including the injection sites, intense fluorescence of ICG was observed by PDE. From the right ankle, two linear fluorescent signals immediately appeared after the injection and then reached to the right popliteal fossa and the inguinal region, respectively. No fluorescent signal was observed

on the proximal area of the inguinal region, nor on the other parts of the body except for the right hind limb.

Circumferential lengths of the right hind limbs were almost same as the left in all the rats.

Abnormal images limited in the limb

The fluorescent signal did not show a linear pattern in any parts of the treated hind limb, but was distributed diffusely and/or made spotted fluorescent signals in all the cases. Such abnormal images were limited to the treated hind limb.

Circumferential lengths of the treated hind limbs increased soon after surgery and achieved peak lengths as follows: the period of the maximum difference between the lengths of treated and untreated hind limbs was on day 3 for three rats, week 1 for five rats and week 2 for two rats.

Appearance of new flow patterns

As new flow patterns, network-like and linear fluorescent signals appeared in all the rats. Such patterns appeared at week 1 in two of twelve rats, week 2 in five rats, and week 3 in five rats after surgery, respectively.

A network-like pattern of the fluorescent signal was dense around the surgical site from the anterior thigh to the lower abdomen. In addition, the fine and small network-like signal was collected at one or several points of the lower abdomen and became a linear pattern. All lines led to and reached the ipsilateral axillary fossa and accompanied superficial epigastric and thoracoepigastric veins. With moving pictures by PDE, the fluorescent flow which moved from the lower abdomen toward the axillary fossa was identified. In nine of twelve rats, the network-like pattern of fluorescent signals was also observed to pass transversely on the suprapubic region and then reached to the contralateral inguinal fossa. A linear pattern was not seen in this part. The diffuse and spotted fluorescent signals remained in the anterior thigh even though the network-like and linear flow patterns appeared. In the gluteal area and the dorsal region of the trunk, the network-like fluorescent signal was barely or never seen.

Regarding circumferential length, there was a considerable variation among the rats.

Stability of flow pattern

All the rats showed a new route to the ipsilateral axillary fossa beyond the incision line. When the new flow patterns began to appear, three rats had a single route to the ipsilateral axillary fossa, and in addition, the remaining rats had another route to the contralateral inguinal fossa. However, the route to the contralateral inguinal fossa disappeared in three rats during observation. The disappearing time of the route to the contralateral fossa in each rat was at week 2, week 5, and week 8 after surgery, respectively. As a result of adding three rats which had only a single route to the

ipsilateral axillary fossa from the beginning, at least a total six rats had a single route to the axillary fossa at the end of the observation. Regarding the network-like pattern and the route to the ipsilateral axillary fossa, there were a few variations among the rats, but each rat maintained one's specific flow patterns at least until the end of the observation. Diffuse and spotted signals decreased with the passage of time, since the flow patterns were stabilized and completely disappeared at around eight weeks after surgery in all the rats. The network-like pattern at the lower abdomen and the linear pattern to the axillary fossa had been seen continuously, at least until the end of observation. Less fluorescent signals still remained in the gluteal and dorsal regions of the trunk, compared to the anterior thigh and the abdomen.

In the circumferential lengths of the treated hind limbs, a mild reduction continued to be close to those of the untreated hind limb.

Statistical analysis

The median difference of the circumferential lengths was 0 cm (from -0.1 to 0.2) on the preoperative period. Then it became longer as 0.75 cm (from -0.2 to 1.9) on the day 3, 0.9 cm (from -0.2 to 2.6) on the week 1 respectively. Shortly after that, it dropped to 0.55 cm (from -0.1 to 1.8) on the week 2. After the week 3 to the week 10, the median difference decreased from 0.4 cm (from -0.4 to 1.2) to 0.1 cm (from -0.2 to 0.6).

As results of Wilcoxon test with Bonferroni correction, there was significant differences between the pre-operative length and the day 3, and between the pre-operative length and the week 1 ($p < 0.005$). After the week 3, there were no significances.

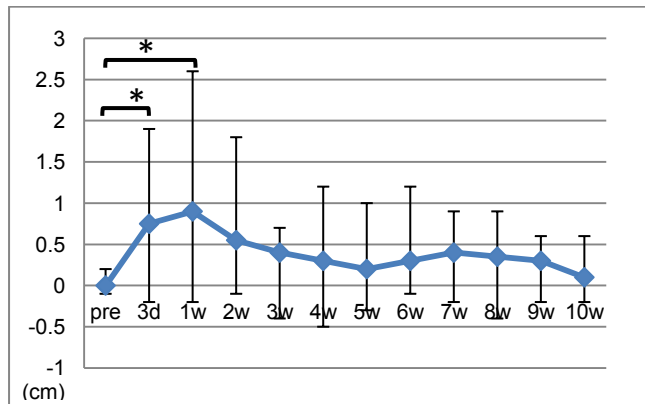


Fig.1 The vertical axis is for the median difference of circumferential lengths between the treated and the untreated hind limbs. The horizontal axis is for time. There are significant differences between the pre and the day 3, and between the pre and the week 1 ($*p < 0.05$)

Discussion

In the present study using the PDE system, it appears that lymph node excision and vessel ligation at the inguinal site leads to the development of collateral pathways to the ipsilateral axillary and contralateral inguinal lymph nodes. Dermal backflow signs considered as lymphedema appeared in the treated hind limbs and then gradually disappeared after the collateral pathways were established. Therefore, collateral pathways are presumed to have a crucial role in improving lymphedema and for compensating for

lymphatic circulation from a lower extremity. In particular, the pathway to the ipsilateral axillary lymph nodes may have a large potential allowing lymph fluids to drain into the deep lymphatic system, because lymph flow movement toward the ipsilateral axillary lymph nodes was continuously observed in spite of the disappearance of the suprapubic pathway. This was first confirmed as real time lymph movement using the PDE video system. Lymph labeled by ICG was observed by vide-recording to vigorously move from the paw, beyond the incision and to the ipsilateral axilla. Considering our findings using PDP video, it is possible that the collateral pathway to the ipsilateral axillary lymph node may be activated in patients suffering from lower extremity lymphedema.

Superficial cutaneous lymph capillaries seen as network-like patterns were observed from the thigh to the lower abdomen beyond the incision. Therefore, it is supposed that they also play a greater role in connecting the treated hind limb and the collateral pathway. In the present study, a spread of the superficial lymph network crossing the incision line was observed. We emphasize that lymph capillaries regenerate and/or connect to each other, and spread to beyond the affected region where the lymph transportation system is damaged. The capillaries might reach adjacent normal lymph collectors and then drain into normal lymph nodes.

The present study employed circumferential measurements in parallel with ICG lymphography. The statistical analysis shows that there are significant differences in the median differences of the circumferential lengths between the preoperative period and the day 3, and between the preoperative period and the week 1. This may coincide with the stage that abnormal images limited in the treated limb. The decline from the week 2 could overlap the stage of the appearance of new flow patterns. Although apparent swelling of the treated hind limbs was not identified until two weeks after surgery, ICG lymphography could detect significant changes in lymph flow during this period. Therefore, for the early detection of lymphedema, it is important to not depend exclusively on visible swelling. Indocyanine green lymphography may improve clinical practice greatly.

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Relations health literacy to knowledge and selfcare behaviors in patients receiving hemodialysis

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Background

The development of medical technology has increased the average life expectancy, but 50 % of people older than 40 years show signs of chronic disease. The number of patients receiving hemodialysis with diabetes mellitus, hypertension and nephritis was 117,000 in 2010, which was 36 % higher than the number in 2005 reported [1]. Health care providers should help to prevent a worsening of symptoms and complications through selfcare at home. These efforts will help to enhance the quality of life of patients with chronic disease.

Health literacy means the ability to obtain basic information and services, processes and understanding [2]. Health literacy is an important predictor of selfcare behaviors for patients with chronic disease [3]. In previous studies, patients with low level of health literacy have a higher frequency of complications than those with high level of health literacy within similar demographics [4].

According Korean Educational Development Institute (KEDI) [5] report, low level of health literacy of Koreans was 38 %, which was the lowest among OECD countries. Therefore, it needs that analyzing the previous study to identify the affecting factors on health literacy among patient receiving hemodialysis.

Purpose

The aim of this study was to identify of health literacy, knowledge on disease, and compliance of selfcare through the literature review in patients receiving hemodialysis. The results may support to plan and provide an education program.

The specific objectives as follows: (1) identifying the study design; (2) identifying the characteristics of the study participants; (3) identifying the measurements to evaluate the health literacy; and (4) analyzing the relating factors on health literacy.

Method

Design

The database PubMed (provided by the US National Library of Medicine), RISS (provided by the Korea Education and Research Information Service) and NDSL (National Discovery for Science) were used in the search for the following terms: hemodialysis, health literacy, knowledge and adherence to self-care.

Among the 10 searched papers, three research papers (from RISS and NDSL) and seven research papers (from PubMed) that matched the purpose of this study, to identify the relating factors on health literacy.

Result

1. Design

The studies included one literature review study [18] and nine descriptive studies [9-12, 14-17, 19] to identify the relationships between demographic characteristics and health literacy.

2. Study participants

Four studies for the patient receiving hemodialysis, one for hypertensive patient, two for elderly patient, one for outpatient, and one for inpatient were examined.

3. Measurement

Three studies used a rapid estimate of adult literacy in medicine (REALM) [6] and one study used the Test of Functional Health Literacy in Adults (TOFHLA) [7]. In addition, two studies used a developed instrument by researchers.

In Korean studies, one study used the Newest Vital Sign [8], one study used the REALM, and one study used a developed instrument by researchers.

4. The relationship between health literacy and variables

4-1 Researches in Korea

1) A study for the Korean elderly, 45.4% was found to have low level of health literacy [9]. This proportion was higher than 38% which is the proportion of low level of health literacy in Korean population [5].

2) A study for outpatients revealed 18.3% to have low level of health literacy and 24.5% with a possibility of having low level of health literacy [10].

3) A study for inpatients located rural area revealed 30.6% to be unable to interpret the Korean language [11].

4-2 Researches in other countries

1) Two studies that analyzed the characteristics of hemodialysis patients, 34% had low level of health literacy.[12,13] Moreover, African Americans, Hispanics, males, low education level, and those with a lower income had low level of health literacy [12-16].

2) The mortality of hemodialysis patients with low level of health literacy was 1.5 times higher than patients with adequate health literacy [13].

3) In elderly patients, 28.7% had low health literacy, 18.9% had a possibility of having low level of health literacy. The reason of the high proportion for elderly patients was self-care behavior such as medication, exercise, and regular check-up [17].

4) One of the reasons of noncompliance taking medication for hemodialysis patients was low level of health literacy. The present result shows that the patients were not able to take right dose of medicines cause by the patients were difficult to understand of their prescriptions or the size of letters of the prescriptions was too small to read. [18] This result showed in the study for hypertensive patients. There was a significant positive correlation between the level of knowledge and the level of health literacy [19].

Conclusion

Low level of health literacy was found to be related to a higher mortality rate of hemodialysis patients and negatively effect to patient outcomes cause by poor understanding on their disease. In addition, low health literacy effect to patients by a poor understanding of unfamiliar medical terms or a poor practical medical application. Therefore, the incidence rate of complication, readmission, hospital days, and mortality will increase.

Before developing health education programs, it is important to identify the patients' health literacy and relating factors. It will help to develop the suitable education program to consider their health literacy level.

Implication & Suggestion

1) These results highlight the need to evaluate the health literacy of hemodialysis patients in Korea considering age, education level, etc.

2) All Korean studies used different measurements to exam health literacy. It suggest to develop standardized measurements for Korean.

3) The current status of health literacy of hemodialysis patients should be examined, and after considering the variables in previous studies, the influential factors for self-care compliance should be investigated.

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LIFE ACTIVITIES IMPROVE HEART RATE VARIABILITY IN PATIENTS WITH HYPERTENSION AND/OR HEART FAILURE

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Introduction

Recently we found the potential importance of life activities in patients with mild hypertension and/or initial stage of heart failure¹. We will present some data concerning these findings for possible usefulness in nursing.

Heart failure is a common, disabling syndrome, and is the final common pathway for a number of cardiac conditions, but it is most commonly related to hypertension or atherosclerotic disease. In the 2001 version of the ACC/AHA guidelines, heart failure was classified on the basis of a new concept of disease progression in heart failure. The importance of the stage classification has been emphasized in each subsequent revision of the guidelines. Furthermore, appropriate treatment, early diagnosis, and early intervention have been reported to be extremely important. In other words, it has been emphasized that prevention is an important treatment. The continuation of physical activity has been demonstrated to be indispensable for prevention even with or without medication.

A common finding in patients with chronic heart failure is exercise intolerance, which causes progressive functional deterioration. There are multiple mechanisms that are potentially responsible for the impairment of physical capacity. There are two important issues involved, namely the maintenance of heart function and physical capacity. Several prior studies have demonstrated the ability of exercise training to improve functional capacity in patients with heart failure². Laterza et al. reported that exercise training significantly reduced blood pressure in hypertensive patients³. Most of these previous studies showed that exercise training had positive effects on physical capacity, health related quality of life (HRQOL), and biomarkers, and observed relatively few complications during training. A number of investigators have reported that comprehensive cardiac rehabilitation has beneficial effects on mortality and physical capacity⁴.

The purpose of the present study was to determine the effects on heart rate variability (HRV) of home-based daily activity in patients with mild hypertension and/or the stable angina pectoris and to clarify the relationship between daily activity and sympathovagal balance.

Materials and Methods

This study was conducted from 2010 to 2011 as a nonrandomized 6-month prospective longitudinal study involving patients with mild hypertension and/or stable angina pectoris in ACC/AHA stage A, who were being treated in primary care clinics in two different areas. Sixty patients participated in the present study. Daily activity and HRV were measured at the start of the study (BASE) and 6 months after the start of the study (6MoA). Daily activity was calculated according to the calorie consumption for an active mass meter. A total of 19 participants were unable to complete the study protocol. Implementation of the Holter 24-hour ambulatory electrocardiograms and/or measurement of daily activities were difficult for the patients. Forty-one patients were investigated for the final analyses.

Subjects: This study consisted of 41 patients (59 to 83 years old; 25 men). The inclusion criteria were: (1) clinically stable

status with mild hypertension and/or stable angina pectoris in ACC/AHA stage A; (2) in sinus rhythm; and (3) receiving standard medical therapy without change during the study. Exclusion criteria included the inability to measure daily activity, and the presence of a pacemaker, atrial fibrillation, or dementia. BASE characteristics of the study population are given in Table 1. All patients provided written informed consent to participate in this study. This study was approved by the Scientific and Ethical Committee of our university.

Data analysis: Data were expressed as median and range unless otherwise indicated. All statistical analyses were performed using a commercial software package. For statistical evaluation, nonparametric tests (Mann-Whitney U test, Wilcoxon signed-rank test) were used to avoid potential errors from non-normally distributed data. A value of $p < 0.05$ was considered statistically significant.

Results

The daily activity increased in 23 patients (the increase (IC) group) 6MoA, while it decreased in the remaining 18 patients (the decrease (DC) group). Most of the patients in both groups were men (13 in the IC group, 12 in the DC group; $p = 0.540$). Twelve patients in the IC group suffered from only hypertension without stable angina pectoris, while 8 patients suffered from only hypertension without stable angina pectoris in the DC group ($p = 0.756$). There were 8 patients with mild hypertension and stable angina pectoris in the IC group, and 7 patients with mild hypertension and stable angina pectoris in the DC group. The patients in the present study were taking some medication, but their medication did not change during the study period. There were no significant differences in coronary heart disease risk factors and use of concomitant medications between the IC and DC groups (Table 1).

	Increase group (n = 23)	Decrease group (n = 18)	P
Age, median (interquartile range), y	70 (59–83)	72 (61–83)	0.854
Men sex, n (%)	13 (56.5)	12 (66.6)	0.540
BMI, median (interquartile range)	23(19–37)	23(18–31)	0.803
HT without AP, n	12	8	0.756
AP without HT, n	3	3	1.000
AP and HT, n	8	7	1.000
Medications, n (%)			
Angiotensin II receptor antagonist	15 (65.2)	9 (50.0)	0.358
Calcium antagonist	13 (56.5)	12 (66.6)	0.540
Coronary vasodilator	5 (21.7)	2 (11.1)	0.438
Diuretics	2 (8.6)	3 (16.6)	0.638
β-blocker	4 (17.3)	7 (38.8)	0.164
Smoking history	4 (17.3)	1 (5.5)	0.363

Abbreviations: BMI, Body Mass Index; AP, Angina Pectoris; HT, Hypertension.

There were no significant differences in HF, sleep HF, LF/HF, and sleep LF/HF in the DC group between the BASE and 6MoA. There were significant increases in HF in the IC group from BASE to 6MoA ($p = 0.048$). There were significant decreases in sleep LF/HF in the IC group from BASE to 6MoA ($p = 0.038$) (Table 2).

Table 2. Autonomous nervous system indices in patients at baseline and after 6 months.

Characteristics (ms^2)	Increase group (n = 23)			Decrease group (n = 18)		
	Baseline	After 6 months	P	Baseline	After 6 months	P
HF	144 (18-401)	151 (48-440)	0.048	107 (22-279)	135 (33-327)	0.151
Sleep HF	182 (51-579)	184 (71-783)	0.162	142 (24-395)	194 (18-437)	0.098
LF/HF	1.9 (0.4-4.6)	1.5 (0.7-4.8)	0.090	2.2 (0.8-6.2)	2.2 (0.7-7.2)	0.305
Sleep LF/HF	1.5 (0.4-4.3)	1.4 (0.5-3.8)	0.038	1.6 (0.5-5.2)	1.8 (0.6-5.9)	0.102

Abbreviations: HF, High Frequency at the average for 24 hours; Sleep HF, High Frequency during hours of sleep; LF, Low Frequency; LF/HF, LF to HF ratio at the average for 24 hours; Sleep LF/HF, LF to HF ratio during hours of sleep.
Data are presented as the median (minimum-maximum).

Discussion

This study demonstrated that home-based daily activity had positive effects on improving the autonomous nervous system in outpatients with mild hypertension and/or stable angina pectoris in ACC/AHA stage A. The present study also showed that an increase in active mass was able to improve HRV outcomes such as increased HF and decreased LF/HF during sleep, whereas there was no statistical change with a decrease in active mass. Pagani et al. showed that in hypertensive patients who feature clear signs of elevated sympathetic activity, moderate exercise training decreased the LF component of HRV while simultaneously increasing the HF component⁵. The participants in the present study were older compared to participants in previous studies, and did not undergo exercise training. Nevertheless an increase in home-based daily active mass was able to improve HRV. Our results partly accord with findings that cardiac rehabilitation was effective in patients with a mean age of 78 with coronary artery disease⁶. Hammill et al. demonstrated that a significant dose-response relationship existed between the number of cardiac rehabilitation sessions attended and long-term outcomes among elderly patients. The average age of the participants in the present study was 71⁷. As shown in previous studies, it is not clear whether participants were able to further increase physical capacity in the present study. However, the increase in active mass may have contributed to the improvement in HRV.

The patients in the present study did not participate in rehabilitation in a hospital. The cost of inpatient rehabilitative care was significantly higher than that of outpatient care⁸. If the benefits obtained from outpatient services are not significantly inferior to those of longer inpatient rehabilitation, such outpatient approaches could result in substantial cost reductions. Previous studies have not indicated that hospital-based rehabilitative care had lasting benefits⁹. In addition, Taylor et al. reported that home- and center-based cardiac rehabilitation appeared to be equally effective in improving clinical and HRQOL outcomes. This suggests that daily low intensity exercise can be effective. Hwang et al. sought to examine the effectiveness of home-based exercise on physical capacity in patients with heart failure compared with conventional medical care¹⁰. O'Connor et al. demonstrated that home-

based exercise training had a statistically significant effect on the primary end point of all-cause mortality or all-cause hospitalization and for the secondary end point of cardiovascular mortality or heart failure hospitalization¹¹. Gando et al. reported that, with low intensity physical activity, attenuation of arterial stiffening was greater with a high quantity of activity than with a low quantity of activity, especially in unfit elderly people¹². These results suggest that incorporating the rehabilitation of patients in everyday life may be important. People accumulate low intensity movement in addition to walking in everyday life. Future studies should focus on home-based low intensity exercise programs in order to further evaluate their subtle positive effects.

Conclusions

In patients with mild hypertension and/or stable angina pectoris in ACC/AHA stage A, an increase in active mass improved HRV in daily life outcomes, with increased HF, and decreased LF/HF during sleep.

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Post-trauma stress and anxiety among ICU nurses : A preliminary study

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Introduction

The intensive care unit (ICU) is a stressful environment due to high patient mortality, daily confrontations with ethical dilemmas, and a tension-charged atmosphere [1]. ICU nurses work in a demanding environment where they are repetitively exposed to traumatic situations and stressful events. Repetitive exposure to extreme stressors and the inability to adjust to this environment may result in the development of significant psychological problems, such as anxiety or depression in some critical care nurses[2]. There is little research on the psychological effects on nurses as a result of working in the ICU[3]. The purpose of this study, hence, was to explore the post-trauma stress and anxiety among ICU nurses.

Materials and Methods

Descriptive research design was conducted. Using convenient sampling, twenty-two nurses working at the intensive care unit in a general hospital participated. The instruments were Korean version of Impact of Event Scale – Revised (K-IES-R) and Korean version of Beck Anxiety Inventory (K-BAI). K-IES-R consists of 22 items with 5 Likert type scale ranging from 0(not at all) to 4 (often). K-IES-R includes 4 subscales, which are hyperarousal, avoidance, intrusions, and sleep & numbness[4]. K-BAI consists of 21 items with 4 Likert type scale ranging from 0 (not at all) to 3(severely)[5]. For data analysis, descriptive statistics and correlational analysis were done.

Results

General characteristics of ICU nurses are shown in table 1. In this preliminary study, the common traumatic experiences encountered for one year period were stress related to not being able to save a specific patient (n = 20, 91%), seeing patients die (n = 19, 86%), verbal abuse from family caregivers (n = 17, 77%), and verbal abuse from physicians and nurses (n = 17, 77%). Seventeen of the 22 (77%) nurses have been having traumatic experiences more than and equal to 3 episodes during one year. For the severity of posttraumatic stress reaction, the average IES-R score in this sample was 1.0. Among 4 subscales, the mean score of intrusion subscale was 1.2, which was the highest. In the intrusion subscale, mean of ‘any reminder brought back feelings about it’ item was 1.9, the highest score. For anxiety, the mean score of ‘nervous’ item was 1.0, which was the highest among 21 items. No significant relationships were found between demographic factors and traumatic experiences, suggesting that everyone would have an equal chance of being affected by traumatic events in the ICU. There was a statistically significant correlation between posttraumatic stress reaction and anxiety ($r = .425, p < .05$), indicating that the more post-traumatic stress, the higher anxiety occurs.

Table 1. General characteristics of participants (N = 22)

Variable	n (%)	Mean ± SD
Gender		
Male	4 (18.2)	
Female	18 (81.8)	
Age(years)		30.0 ± 5.32
21-30	14 (63.6)	
≥ 31	8 (36.4)	
Marital status		
Married	8 (36.4)	
Single	14 (63.6)	
Religion		
Yes	16 (72.7)	
No	6 (27.3)	
Education in nursing		
Diploma	6 (27.3)	
BSN	16 (72.7)	
Clinical experience(years)		6.6 ± 5.77
≤ 1	4 (18.2)	
1-5	7(31.8)	
6-10	4 (18.2)	
> 10	7 (31.8)	
ICU experience(years)		3.6 ± 3.42
≤ 1	7 (31.8)	
1-5	7 (31.8)	
6-10	6 (27.3)	
> 10	2 (9.1)	

Conclusions

In recent, the traumatic events are more prevalent in ICU nurses. In this study, ICU nurses who had more post-traumatic stress experienced high anxiety. These findings may have important implications regarding methods that could reduce psychological problems (i.e., anxiety, depression) and could enhance job satisfaction for ICU nurses. Further studies that determine the specific characteristics that predispose individuals to the development of psychological problems and identify specific interventions for these individuals are warranted.

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FACTORS RELATED TO MUSCULOSKELETAL SYMPTOMS AMONG FEMALE FAMILY CAREGIVERS

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Introduction

Japanese society is aging rapidly. Long-Term Care Insurance Act was enforced in 2000 to resolve the problem of an aging society by the socialization of caregiving. After that, the caregivers have used various services, while they are having various mental and physical symptoms. The musculoskeletal symptoms such as stiffness in the shoulder and lumbago are major ones among the family caregivers. However, the association between caregiving and musculoskeletal symptoms remains unclear because those symptoms are popular even among elderly noncaregivers. In addition, the lifestyle factors related to musculoskeletal symptoms among elderly females also remain to be discussed. The purpose of this study is to clarify the lifestyle factors associated with musculoskeletal symptoms and to elucidate the contribution of caregiving to the onset of musculoskeletal symptoms among elderly females.

Methods

Study population: Study subjects consisted of 160 female in-home primary caregivers for persons requiring care at level 3 or suffering from dementia (caregiver group) and 160 noncaregiver females matched 1:1 in the same decade of life (noncaregiver group). Average age was 62.8 ± 11.9 years in the caregiver group and 63.0 ± 12.2 years in the noncaregiver group. They were asked to fill out a self-administered questionnaire about lifestyle and health status, including musculoskeletal symptoms.

Study variables: Participants were asked, "Do you have stiffness in the neck, shoulder, or back?", "Do you have pain or stiffness of muscle and joint?", and "Do you have lumbago?" about musculoskeletal symptoms. Our questionnaire also included several other items covering demographics such as: age, body weight and height, menopausal status, current employment (Yes/No), perceived stress (Yes/No), sleep disturbance (Yes/No), hypertension (Yes/No), regular exercise (Yes/No), smoking status (Current/Former or Never), and alcohol consumption (Current/Former or Never).

Statistical methods: To elucidate the differences in study variables between caregiver and noncaregiver groups, we calculated proportions, means, and standard deviations. Chi-squared test or Student's t-test was performed to explore the potential association of caregiving with study variables. Next, 320 study subjects were divided into two groups by the presence or absence of the musculoskeletal symptoms which present the significant differences between caregiver and noncaregiver groups. We aimed to elucidate the factors related to musculoskeletal symptoms. So we computed the odds ratios (ORs) and 95% confidence interval (CI) of musculoskeletal symptom for each study variable using logistic regression analysis. Furthermore, multiple logistic regression analysis was performed to identify variables independently associated with musculoskeletal symptoms. The multiple logistic regression model included the variables whose crude ORs were significant.

All analyses were performed using the SPSS 17.0 statistical package. $P < 0.05$ was considered statistically significant.

Results

Table 1 shows comparisons of characteristics between female caregivers and noncaregivers. As for musculoskeletal symptoms, the proportions of subjects with stiffness in the neck, shoulder, or back and those with lumbago in the caregivers (60.6% and 55.0%, respectively) were significantly higher than in the noncaregivers (46.9% and 33.8%, respectively). The proportions of subjects who felt stress and who had sleep disturbance in the caregivers were significantly higher than in the noncaregivers. More subjects in the caregivers had hypertension. The proportions of subjects who were employed and who exercised regularly were significantly lower in the caregivers.

Comparisons of characteristics between persons with and without stiffness in the neck, shoulder, or back and ORs (95% CI) for stiffness in the neck, shoulder, or back are presented in Table 2. Caregiving, perceived stress, and sleep disturbance were significantly and positively associated with stiffness in the neck, shoulder, or back. Additionally, age, BMI, menopause, and regular exercise were significantly and negatively associated with it. After multivariate-adjustment, perceived stress [OR (95% CI) = 1.85 (1.06-3.21)], sleep disturbance [OR (95% CI) = 2.23 (1.30-3.83)], and regular exercise [OR (95% CI) = 0.52 (0.31-0.85)] were still significantly associated with stiffness in the neck, shoulder, or back. The association of caregiving with stiffness in the neck, shoulder, or back was attenuated.

Table 3 shows comparisons of characteristics between persons with and without lumbago and ORs (95% CI) for lumbago. Caregiving and perceived stress were also significantly and positively associated with lumbago and regular exercise was also significantly and negatively associated with lumbago. After multivariate-adjustment, caregiving [OR (95% CI) = 1.94 (1.19-3.14)] and perceived stress [OR (95% CI) = 1.73 (1.01-2.94)] were mutually and independently associated with lumbago.

Discussion

In our study, we found that family female caregivers felt more stress, had more sleep disturbance, and exercised less regularly than female noncaregivers. It was also found that female caregivers had higher proportion of stiffness in the neck, shoulder, or back and lumbago than female noncaregivers. Furthermore, we elucidated some factors related to musculoskeletal symptoms among elderly females. Perceived stress, sleep disturbance, and regular exercise were significantly associated with stiffness in the neck, shoulder, or back. Perceived stress was significantly associated with lumbago independent of caregiving. These findings suggest that more stress, more sleep disturbance, less regular exercise in female caregivers may lead to their musculoskeletal symptoms. It is well known that the causes of stress, sleep disturbance, and lack of exercise in caregivers are different from those in noncaregivers. Therefore, information and support for each female caregiver should be proposed in consideration of her situation and according to her needs.

Another important finding in our study was that caregiving was independently associated with lumbago. Lumbago may be associated with factors specific to the caregiving situation other

than lifestyle. It is necessary to conduct further studies on the association between musculoskeletal symptoms and the caregiving situation among caregiver group.

Conclusion

More female in-home primary caregivers felt stiffness in the neck, shoulder, or back and lumbago than noncaregiver females. The stiffness of the neck, shoulder, or back was suggested to be due to stress, sleep disturbance, and lack of exercise in female caregivers, while lumbago may be associated with factors specific to the caregiving situation other than lifestyle besides stress.

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Table1 Comparisons of characteristics between female caregivers and noncaregivers.

	Family caregiver (n = 160)	Noncaregiver (n = 160)	p value
	Mean ± SD number (%)	Mean ± SD number (%)	
Demographics			
Age	62.8 ± 11.9	63.0 ± 12.2	ns
Height (cm)	152.8 ± 5.6	151.5 ± 6.4	*
Weight (kg)	52.3 ± 7.9	52.2 ± 7.5	ns
BMI (kg/m ²)	22.4 ± 3.1	22.8 ± 3.3	ns
Menopause (Yes)	136 (85.0%)	131 (81.9%)	ns
Current employment (Yes)	37 (23.1%)	55 (34.4%)	*
Health status			
Stiffness in the neck, shoulder, or back (Yes)	97 (60.6%)	75 (46.9%)	*
Pain or stiffness of muscle and joint (Yes)			
	69 (43.1%)	53 (33.1%)	ns
Lumbago (Yes)	88 (55.0%)	54 (33.8%)	**
Perceived stress (Yes)	135 (84.4%)	88 (55.0%)	**
Hypertension (Yes)	74 (46.2%)	56 (35.0%)	*
Sleep disturbance (Yes)	61 (38.1%)	37 (23.1%)	*
Lifestyle			
Regular exercise (Yes)	53 (33.1%)	92 (57.5%)	**
Alcohol consumption (Current)	37 (23.1%)	46 (28.8%)	ns
Smoking status (Current)	8 (5.0%)	6 (3.8%)	ns

P values were calculated using chi-square test for categorical data and t-test for quantitative data.

*: p<0.05 **: p<0.01; ns: not significant

Table 2 Comparisons of characteristics between persons with and without stiffness in the neck, shoulder, or back and odds ratios (95% confidence interval) for stiffness in the neck, shoulder, or back.

	With stiffness in the neck, shoulder, or back (n = 172)	Without stiffness in the neck, shoulder, or back (n = 148)	P value	Crude OR (95% CI)	Multivariate OR (95%CI)
	Mean ± SD number (%)	Mean ± SD number (%)			
Demographics					
Age	60.6±12.5	65.5±11.0	**	0.96 (0.94-0.99)*	0.97 (0.95-1.00)
BMI (kg/m ²)	22.2±2.9	23.1±3.5	*	0.93 (0.86-1.00)*	0.94 (0.87-1.02)
Menopause (Yes)	136 (79.1%)	131 (88.5%)	*	0.49 (0.26-0.92)*	0.95 (0.38-2.38)
Current employment (Yes)	50 (29.1%)	42 (28.4%)	ns	1.03 (0.64-1.68)	
Caregiving (Yes)	97 (56.4%)	63 (42.6%)	*	1.75 (1.12-2.72)*	1.12 (0.67-1.87)
Health status					
Perceived stress (Yes)	136 (79.1%)	87 (58.8%)	**	2.65 (1.62-4.33)*	1.85 (1.06-3.21)*
Hypertension (Yes)	69 (40.1%)	61 (41.2%)	ns	0.96 (0.61-1.49)	
Sleep disturbance (Yes)	63 (36.6%)	35 (23.6%)	*	1.87 (1.14-3.05)*	2.23(1.30-3.83)*
Lifestyle					
Regular exercise (Yes)	62 (36.0%)	83 (56.1%)	**	0.44 (0.28-0.69)*	0.52 (0.31-0.85)*
Alcohol consumption (Current)	49 (28.5%)	34 (23.0%)	ns	1.34 (0.81-2.22)	
Smoking status (Current)	9 (5.2%)	5 (3.4%)	ns	1.58 (0.52-4.82)	

P values were calculated using chi-square test for categorical data and t-test for quantitative data.

Dependent variable: stiffness in the neck, shoulder, or back (0: no; 1: yes)

Explanatory variable: age (continuous), BMI (continuous), menopause (0: no; 1: yes), current employment (0: no; 1: yes), caregiving (0: no; 1: yes), perceived stress (0: no; 1: yes), hypertension (0: no; 1: yes), sleep disturbance (0: no; 1: yes), regular exercise (0: no; 1: yes), alcohol consumption (0: former/never; 1: Current), and smoking status (0: former/never; 1: Current).

*: p<0.05 **: p<0.01; ns: not significant

Table 3 Comparisons of characteristics between persons with and without lumbago and odds ratios (95% confidence interval) for lumbago.

	With lumbago (n = 142)	Without lumbago (n = 178)	P value	Crude OR (95% CI)	Multivariate OR (95%CI)
	Mean ± SD number (%)	Mean ± SD number (%)			
Demographics					
Age	63.1±11.6	62.7±12.4	ns	1.00 (0.98-1.02)	
BMI (kg/m ²)	22.7±3.3	22.5±3.1	ns	1.02 (0.95-1.09)	
Menopause (Yes)	119 (83.8%)	148 (83.1%)	ns	1.05 (0.58-1.90)	
Current employment (Yes)	34 (23.9%)	58 (32.6%)	ns	0.65 (0.40-1.07)	
Caregiving (Yes)	88 (62.0%)	72 (40.4%)	**	2.40 (1.53-3.77)*	1.94 (1.19-3.14)*
Health status					
Perceived stress (Yes)	112 (78.9%)	111 (62.4%)	*	2.25 (1.36-3.73)*	1.73 (1.01-2.94)*
Hypertension (Yes)	58 (40.8%)	72 (40.4%)	ns	1.02 (0.65-1.59)	
Sleep disturbance (Yes)	48 (33.8%)	50 (28.1%)	ns	1.31 (0.81-2.11)	
Lifestyle					
Regular exercise (Yes)	54 (38.0%)	91 (51.1%)	*	0.59 (0.38-0.92)*	0.74(0.46-1.18)
Alcohol consumption (Current)	35 (24.6%)	48 (27.0%)	ns	0.89 (0.54-1.47)	
Smoking status (Current)	9 (6.3%)	5 (2.8%)	ns	2.34 (0.77-7.15)	

The role of nurses in trauma teams

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Introduction

Since prompt treatment of trauma after various accidents is critical in preventing further injuries and reducing death rate, it is required to establish emergency medical system and raise trauma treatment levels of emergency medical professionals[1].

Establishing a trauma center is the heart of creating trauma treatment system. Well-established trauma treatment system is still developing by continuous improvement, which is a result of ceaseless effort as well as designating severe trauma centers[2].

Medical professions working in trauma teams can be various in its proportion depending on the scale of trauma center, but some specialists are necessary at least as below. Any professions in the team treats trauma in association with other professions[3].

- a. Trauma physician
- b. Emergency medical physician
- c. Anesthesiologist
- d. Neuro-surgery, Orthopedic surgery specialist
- e. ICU Specialist
- f. Radiology specialist
- g. Residents for each speciality above
- h. Emergency RN
- i. Medical record officer
- j. Medical Laboratory Technologist
- k. Radiographer
- l. ICU RN
- m. OR RN
- n. Administration, Social worker and Security

Yonsei University Wonju Christian Hospital runs a trauma team to meet the demand of a growing number of trauma patients and tries to be designated as a regional trauma center. When a trauma patient arrives at ER, messages are sent to GS, CS, NS, OS, PS, Anesthesiologist and chief residents through OCS(order communication system) in the present system[3]. But there is no policy or written forms to define criteria of role or duty of RN in trauma team.

The purpose of this study was to review the role of the nurses in trauma teams in domestic and compare it with overseas cases.

Materials and Methods

Subjects: The database PubMed (provided by US National Library of Medicine), RISS (provided by Korea Education and Research Information Service) and KISS (Korean Studies Information Service System) were used to search for the terms trauma team, trauma center and role of RN in abstracts published from 2001 up to present date.

Data analysis: Five studies were found to be eligible showing the status of current trauma team and 2 of 5 studies were reviewed to compare the roles of RN in the trauma team in domestic and abroad.

Results

When a trauma patient arrives at ER, it's often difficult to treat multiple or severe trauma systematically and promptly because little experienced physicians are often responsible for primary treatment with the current medical system. In 1999, the result of the survey for trauma patient death status revealed the PDR (preventable death rate) reached 40.5% in domestic cases [4].

About the roles and duties of trauma team members, Lee has explained some professions' (as listed left) roles and duties in detail in his research related to establishing severe trauma center. But he didn't mention about the specific roles of RN who takes care of the trauma patient at hand in the team except RNs in ICU and ER[5].

On the contrary, in the guideline for trauma team of the University of Florida, it explained its roles, report system and responsibility of RN with 22 other professions in trauma team very specifically, classifying RN into chief nurse, bed side nurse and scribe nurse[6].

Conclusions

As two different literature above has shown, the awareness of the significance of RN's role in trauma team is absent in domestic research, while not in another overseas guideline.

Considering the domestic circumstance that the concept of trauma team is still premature and the role of RN in the team is uncertain, there is a strong need of detailed complement and prospective further studies as Lee[7] has suggested in his research to define the roles of RN in trauma teams so that advance RN's speciality in Korean trauma treatment system.

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Memo

ASSOCIATION BETWEEN WORK ENVIRONMENT AND RESIGNATION INTENTION OF VISITING NURSES

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Introduction

In Japan, home-visit nursing station is responsible for its central role in the transition to home medical care. Home-visit nursing makes it possible to lead a life with home care. It brings various benefits, since it brings comfort and improves the QOL and reduces the burden of caring by family. On the other hand, the high rates of turnover of home-visiting nurses have become clear, so it is necessary to backup and devise for securing a stable human resources.^{1,2} In general, the work environment and the resignation intention have an influence each other. In this study, we focused on work environment which includes the segmentalized work characteristics. We referred to components of job satisfaction and situation of home-visiting nurses, relevant factors have been confirmed by early studies. We aimed to clarify the factors that for work environment and resignation intention of home-visiting nurses.

Methods

Primary research: We called approximately 100 administrators of home-visit nursing stations, requested for cooperation to this investigation and obtained the number of employees as home-visiting nurses in the station.

Secondary research: We conducted a self-administered anonymous questionnaire investigation to the home-visiting nurse by mail or bringing the document to 62 stations where research cooperation agreement had been obtained by primary research. Questionnaire items consisted of demographic characteristics, Nakano's Job Satisfaction Scale³ (4 factors, 28 items), job satisfaction (scale D 8 items) that was uniquely-designed, segmentalized burdens (scale E 26 items) of home-visiting nursing which were also uniquely-designed, the intention of resignation for the past six months, current resignation intention, and feeling of satisfaction as a home-visiting nurse.

Analysis: The resignation intention was coded as [Yes] or [No] according to the current intention. Nakano's Job Satisfaction Scale score was categorized into [High degree of satisfaction] or [Low degree of satisfaction]. Job satisfaction scale (D:8items) score was also categorized into [High degree of satisfaction] and [Low degree of satisfaction]. Score of segmentalized burdens (E: 26 items) of home-visit nursing were categorized into [High burden] or [Low burden]. We mainly used Chi-square test, Mann-Whitney test, and multiple logistic regression analysis.

Results

The number of cooperated stations was 62. We sent 471 questionnaires, and obtained 306 responses (response rate: 65 %). After editing, the number of valid questionnaires was 284. Cronbach's coefficient alpha of Nakano's Job Satisfaction Scale were 0.87 in total, 0.88 for factor1, 0.87 for factor 2, 0.81 for factor 3, and 0.88 for factor 4. With those high rates, internal consistency of the scale was confirmed. Number of nurses who had current resignation intention was 73 (25.7%), while that of those who did not was 211(74.3%).

Relevant factors of resignation intention: (Table 1)

- 1) Demographic characteristics: educational backgrounds (p=0.005), years of experience as a nurse (p=0.033), Health conditions (p=0.018), number of visiting cases in a week (p=0.015).
- 2) Nakano's Job Satisfaction Scale: job satisfaction in total (p=<0.001), Factor 1: Specialties (p=0.007), Factor 2: Management (p=0.001), Factor 3: Human relations (p=0.007), and Factor 4: Intentionality (p=0.001).

Table 1 Relevant 18 items of resignation intention among 28 items of Nakano's Job Satisfaction Scale (n=284)

	OR	95%CI		p-value	
		Min	Max		
Factor1: Specialties					
D3	「Exact assessment」	0.514	0.285	0.926	0.027
D4	「Explanation for exact self-decision」	0.373	0.173	0.805	0.012
D6	「Professional knowledge and technical skill」	0.426	0.232	0.781	0.006
D7	「Specific assessment of nursing」	0.498	0.281	0.885	0.017
D9	「Self-care coaching」	0.443	0.214	0.915	0.028
D10	「Effort to positively affect the workplace」	0.426	0.238	0.764	0.004
D12	「Self-active effort to career」	0.359	0.201	0.642	0.001
Factor2: Management					
D14	「Effort to improve the quality of care in the station.」	0.189	0.097	0.371	<0.001
D15	「Fully deliver the concept and policy in the station」	0.291	0.158	0.535	<0.001
D16	「Support for career in the station」	0.396	0.214	0.733	0.003
D17	「Listen to opinion of junior staff in the station」	0.477	0.256	0.889	0.020
D19	「Appropriate advice by administrator」	0.328	0.165	0.656	0.002
D20	「Trust relationship between administrator and staff」	0.366	0.193	0.695	0.002
Factor3: Human relations					
D23	「Burden of contact with the family of the user」	0.447	0.254	0.787	0.005
D24	「Dilemma between the doctor and user」	0.562	0.321	0.982	0.043
Factor4: Intentionality					
D26	「Like work in home-visit nursing」	0.145	0.052	0.406	<0.001
D27	「Be suited for home-visit nursing」	0.117	0.057	0.242	<0.001
D28	「Rewarding to home-visit nursing」	0.176	0.072	0.430	<0.001

(By multiple logistic regression analysis, adjusting for age, educational backgrounds and years of experience as a nurse.)

- 3) Job satisfaction D of 8 items: 7 out of 8.
- 4) Segmentalized burdens E of 26 items of home-visiting nursing: 12 out of 26.
- 5) Resignation intention for the past six months (p<0.001).
- 6) Feeling of satisfaction as a home-visiting nurse (p<0.001).

Discussion

As shown in Table 1, Nakano's Job Satisfaction Scale had a close association with resignation intention. All four factors were significantly related with the intention. Among them, particularly Factor 2: Management and Factor 4: Intentionality showed a strong relation with resignation intention. Hence, we can infer that home-visiting nurses would make much account of management and intentionality in the job for the consideration of resignation.

Among uniquely-designed job satisfaction scale (D of 8 items) and segmentalized burdens scale (E of 26 items) of home-visiting nursing, 19 items were significantly associated with resignation intention. We divided these 19 items into 5 categories, i.e. 1: education, 2: characteristic of the station, 3: human relations, 4: conditions of employment, and 5: characteristic of the home-visit nursing (Table 2).

As regarding education, inadequate or poor education system in the home-visiting nursing business field might be more likely to lead to resignation. Strong needs of education were shown for improving specialties and their career of the home-visit nurse. Nurses would want to improve their own ability of nursing care at user's house. It is, hence, necessary to create various educational occasions including case conference, in order to appropriately cope with each case by themselves, particularly acute deterioration of the case.

As regarding characteristics of home-visit nursing stations, improvements in management solution and understanding of the operation concept of the station would be important for reducing the resignation of nurses. Nurses may want to have more worthwhile possibility of home-visit nursing work with supports from the station they work. Furthermore, concretely speaking, it would be necessary to expand necessary equipments (such as visiting car, PC and others) in the station environment, and to have nurses less feel anxiety about the management and situation of station revenue.

As to human relations, nurses tended to feel more burdens of having contact with the user's family. We found that the position and role of the family is large in home-visit nursing care. Hence, the communication skills to the user and family need to be improved. In addition, improvement of skills for collaboration with colleagues and other professions are also required.

Among conditions of employment, proper working conditions and assuring holidays will be necessary. As regarding specific characteristics of home-visit nursing, particularly a wide range of determination that the user and family have was shown as nurses' burdens. Short visiting time and user's home conditions such as materials and sanitation and drugs at user's home need to be also considered.

Each factor relevant to resignation intention revealed by the present survey is considered to have influence on each other comprehensively. It will be further necessary to measure the overall relationship. But the present findings would be helpful for better operation of home-visit nursing station to reduce the resignation of home-visiting nurses.

Conclusions

Job satisfaction had strong influence on nurses' resigning will in all four factors, especially in Factor 2: Management and Factor 4: Intentionality. Among uniquely-designed, segmentalized burdens of home-visiting nursing, we found significant associations in 19 items, that were classified into five categories: 1: education, 2: characteristics of the station, 3: human relations, 4: conditions of employment, and 5: specific characteristics of the home-visit nursing. These

factors could be helpful for improving the management and enhancement of human resources in the home-visit nursing business.

Table 2 Factors relevant to resignation intention in original 5 categories (n=284)

		OR	95%CI		p-value
			Min	Max	
1: Education					
D35	「Occasion for case study」	0.316	0.152	0.657	0.002
E2	「Burden of home-visit and decision by itself」	1.816	1.025	3.216	0.041
E6	「Burden of patient's wide variety diseases」	1.991	1.111	3.571	0.021
E18	「Burden of inadequate educational system」	4.076	2.269	7.324	<0.001
E26	「Burden of expedient treatment and coping」	2.956	1.584	5.518	0.001
2: Characteristic of the station					
D33	「Participate in policies and programs of the station」	0.548	0.313	0.959	0.035
D34	「Possibilities of the station」	0.327	0.178	0.599	<0.001
E16	「Burden of Handling of personal information at inside and outside the station」	3.066	1.687	5.569	<0.001
E17	「Burden of inadequate station environment」	2.101	1.196	3.688	0.010
3: Human relations					
D30	「Relationship with the doctor」	0.500	0.276	0.906	0.022
D36	「Human relations in the station」	0.345	0.170	0.701	0.003
E15	「Burden of make a trust relationship with other professions」	2.639	1.493	4.664	<0.001
4: Conditions of employment					
D29	「Feel about salary」	0.556	0.313	0.987	0.045
D32	「Satisfaction with conditions of employment」	0.474	0.268	0.836	0.010
E10	「Burden of difficult to take a vacation」	2.819	1.508	5.268	<0.001
5: Characteristic of the home-visit nursing					
E7	「Burden of user and family have wide range of determination」	2.583	1.432	4.659	0.002
E12	「Burden of short time to home-visit」	1.821	1.035	3.202	0.037
E13	「Burden of inadequate medical equipment, medicine and hygiene product」	1.860	1.032	3.353	0.039
E25	「Burden of maintaining sanitary conditions by itself」	1.856	1.023	3.369	0.042

(By multiple logistic regression analysis, adjusting for age, educational backgrounds and years of experience as a nurse.)

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