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Scientific Research Publishing

Stroke Management Awareness and Behavior among Nursing Students in Bangladesh

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Abstract

Background: Stroke is a significant cause of morbidity and mortality throughout the world. In Bangladesh, stroke accounts for 27% of deaths, making it the third leading cause of death and disability [1]. Nurses have a critical role to play in reducing death and disability among stroke victims, but many nursing students are not being educated to meet the challenges of this complex condition. Objectives: This study examined undergraduate nursing students' awareness of strokes and their stroke patient management behaviors. Method: This was a descriptive study that surveyed undergraduate nursing students about their awareness of strokes and stroke patient management behaviors. One hundred and forty-four students were recruited from Dhaka University's and Rajshahi University's nursing colleges in Bangladesh. The students completed and returned the Awareness of Stroke Risk Factors, Awareness of Stroke Warning Signs, and Behavior of First Responses to Strokes and Behaviors of Special Managements of Stroke questionnaires between December, 2014 and February, 2015. Data were analyzed using descriptive statistics and the Pearson's Product-Moment Correlation-Coefficient. Results: The results showed that nursing students had a moderate awareness level of stroke risk factors (M = 74.24, SD = 12.30) and a very low awareness of stroke warning signs (M = 55, SD = 10.72). In addition, all of the students had a low to very low level of behaviors of special stroke patient management (M = 62.11, SD = 9.75) and a very low level of behaviors of first responses to strokes (M = 0.24, SD = 0.43). There was a significant positive correlation between nursing students' awareness of stroke risk factors and stroke warning signs (r = 0.247**, p < 0.001). However, no significant correlation was found between students' awareness of stroke risk factors with their behaviors of first responses to strokes (r = 0.043, p > 0.05). In addition, their awareness of stroke warning signs was not correlated with their behaviors of special stroke patient management (r = 0.031, p > 0.05). These findings suggested that nursing students need to increase their awareness level to develop stroke management behaviors in order to improve practicum preparedness. Conclusion: Work-based education must

be a part of nursing students' curricula to increase their awareness of strokes and improve their stroke management behaviors to improve practicum preparedness.

1. Introduction

Stroke is the sudden focal neurological dysfunction caused by the blockage or ruptures of a blood vessel in the brain and is a significant cause of morbidity and mortality throughout the world [2]. In Bangladesh, stroke accounts for 27% of deaths and is the third leading cause of death and disability [1], accountings for 11.9% of deaths globally [3]. Stroke has severely negative effects on the quality of life of those who suffer from it, imposing significant burdens on society [4]. Stroke induces negative follow-on effects, including an increased risk of infection, mortality, use of hospital resources, patient care costs, and length of hospital stays and a decreased quality of life [4]. Nurses can play a critical role in reducing death and disability resulting from stroke by identifying risk factors and warning signs to manage the effects of strokes [5].

The occurrence of stroke is associated with lower socioeconomic status and certain lifestyle factors, including smoking, a poor diet, and limited physical activity [6]. It has been estimated that an aging population has caused an increase in the prevalence of major risk factors, including hypertension, diabetes mellitus, and obesity, causing the incidence of stroke to double by 2020 [4]. The most important factors influencing the impact of strokes are nurses' awareness of risk factors, stroke warning signs, their behaviors of first responses to strokes, and behaviors about how to manage stroke victims. One study indicated that emergency nurses were mostly unaware of evidence-based interventions that have been proven to help mitigate and manage the effects of strokes [7]. However, in Bangladesh, there is still a recognized lack of awareness of strokes and stroke management behaviors among undergraduate nursing students, but these students are not alone in their ignorance. International studies indicate that nurses in India, South Korea, Hong Kong, Brazil, Australia, and France are also unaware of the warning signs of and risk factors for strokes [8]-[13].

Nurses who treat stroke patients require extensive education and training in order to deliver quality patient-focused care [14]. However, as indicated above, students often do not receive the necessary education to be able to provide this care. Edwards has observed that nurses of stroke patients often felt ill prepared by their preregistration education [15]. However, students have expressed the importance of being equipped with a sound foundation in stroke awareness before entering clinical practice [16].

To increase students' awareness of and how to manage strokes, nursing stu-

dents must receive more practical stroke management experience as part of their practicum preparedness [16]. A previous study has indicated that work-based educational programs are necessary for equipping students with the necessary skills to manage their stroke patients [14]. However, few studies have specifically examined nursing students' awareness of strokes and stroke management behaviors. This study seeks to help fill that knowledge gap. The results of the study indicate how nursing education should be redesigned in order to increase students' stroke management clinical competency.

Conceptual Framework

This study's conceptual framework was based on the Bloom educational objective taxonomy [17] as modified by Anderson and Krathwohl [18]. In addition, the knowledge-attitude-practice (KAP) model [19] and the existing stroke management literature were used to guide the relationship between awareness, and behavior. According to Bloom, there are three educational objective domains: cognitive, affective, and psychomotor. Knowledge and awareness, attitude and affect, and practice and behavior represent each domain respectively. Within the cognitive domain, knowledge refers to factual, conceptual, procedural, and metacognitive thought while awareness is the mechanism by which one reaches different levels of knowledge. By combining these two dimensions, there are six levels within the cognitive domain: remembering, understanding, applying, analyzing, evaluating, and creating. First three levels are: 1) Remembering is described as retrieving, recognizing, and recalling relevant knowledge from long term memory, 2) Understanding is the meaning, translation, and interpretation of instructions and problems, and 3) Applying is defined as the carrying out or using a procedure through executing or implementing. Within the affective domain, attitude is the cognitive reaction to a perceived event and has five levels: receiving, responding, valuing, organizing, and internalizing [20]. The first three levels includes: 1) Receiving explains awareness, willingness to hear, and selected attention towards the phenomenon, 2) Responding is meant to attend and react to a particular phenomenon, and 3) Valuing is an internalization of a set of specified values which were expressed by an individual's overt behavior. Behavior, a psychomotor domain, refers to the physical movement, coordination and use of motor or neuromuscular activities. This domain is categorized into five levels: imitation, manipulation, precision, articulation, and naturalization. The first three levels are: 1) Imitation covers observing and patterning behavior after someone else, 2) Manipulation is an individual's ability to perform certain actions by following written or verbal instructions, and 3) Precision is an individual's ability to perform a task or activity with expertise and to deliver high quality care without assistance or instructions.

According to Bloom, the first level is the prerequisite to the next, meaning that one cannot effectively address the higher level if they do not learn the below ones. First three levels of each domain are the lower levels of learning, which this study focused on to examine students' foundational levels of awareness and be-

havioral development.

In Bangladesh, nursing students have been trained to provide fundamentals of nursing care, which require the first three levels of learning objectives of each domain. Thus, it is more reasonable to assess them whether Bangladeshi nursing students possess the first three levels in the learning domains. **Figure 1** shows the first three levels of each domain and how they are manifested in stroke management awareness and behavior. According to KAP model, if an individual is aware of certain things, such awareness can greatly influence that individual's ability to perform an action. So the first three levels of awareness and behavior were the key categories for representing nursing students' fundamental stroke management practices in this study.

2. Methods

2.1. Study Design

This study was a descriptive survey designed to explore nursing students' awareness of stroke and stroke management behaviors and the connection between these two variables.

2.2. Sample and Setting

The participants were a sample selected from fourth-year undergraduate nursing students who could read and understand Bengali in Dhaka University's and Rajshahi University's nursing colleges to reduce college size-specific characteristics. Post-basic B.Sc. nursing students were excluded. The sample size was determined by using G-Power version 3.1 with an acceptable level of significance of $\alpha < 0.05$, a test power of 0.80, and a medium effect size of 0.25. In order to avoid experimental failure because of attrition, 20% more subjects were recruited than were statistically required [21]. A total of 144 questionnaires were distributed to the two sample populations between December, 2014 and February, 2015, all of which were completed and returned. Most of the students had been placed in medicine, neuromedicine, and ICU practicum courses because of their curricula's designs.
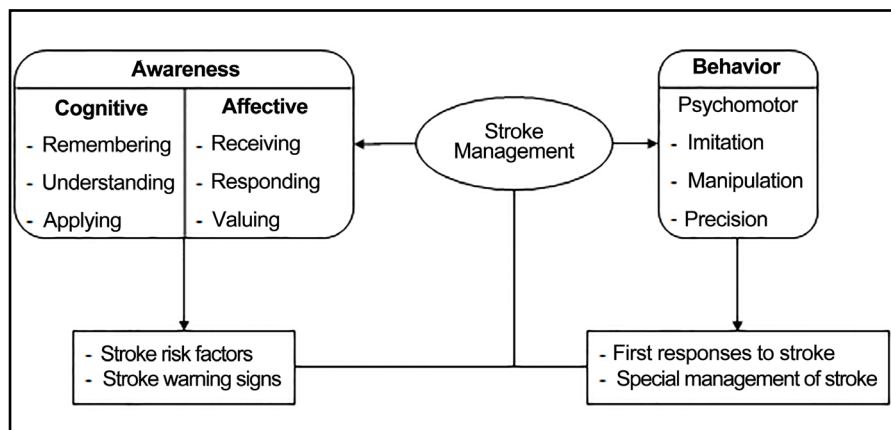
Figure 1. Conceptual framework of the study.

2.3. Ethical Considerations

This study received approval (2015-00003) from the Institutional Review Board of the College of Nursing, Yonsei University, 50 Yonsei-ro, Seodemun-gu, Seoul, South Korea. The purpose of the research was explained in advance to the participants who gave written informed consent based on premise that their participation in the study would be voluntary. The participants were informed of their right to withdraw from the study any time. They confirmed their understanding that the primary data only would be used for research purposes and that their anonymity was guaranteed. The participants were also informed that the completed questionnaires would be kept by the research team during the study period but would be destroyed upon completion of the study. Small gifts of snacks and stationery were provided to the students as compensation for their participation.

2.4. Instruments

The instruments used in this study were as follows: 1) Awareness of Stroke Risk Factors Questionnaire (ASRFQ), 2) Awareness of Stroke Warning Signs Questionnaire (ASWSQ), and 3) Behaviors of First Responses to Strokes Questionnaire (BFRSQ), 4) Behavior of Special Management of Stroke Questionnaire (BSMSQ), and 5) a demographic questionnaire.

2.4.1. Nursing Student's Awareness of Stroke Risk Factors

Nursing student awareness of stroke risk factors was assessed using the 20-item ASRFQ which allowed respondents to answer "true", "false", or "don't know". The inventory was based on the decision-tree analysis model developed by Kim, Jeong, and Kang [22] and was further modified and developed by the research team. Each correct answer received one point while incorrect answers received zero points. Respondents could receive a total of between 0 and 20 points, which was then converted into a percentage. Higher scores indicated higher levels of awareness of stroke risk factors. The Cronbach's alpha of the total ASRFQ was 0.84 [22] for the Korean version. In this study, the measures of internal consistency for risk factors in the related questionnaire were yielded at a Cronbach's alpha of 0.92.

2.4.2. Nursing Student's Awareness of Stroke Warning Signs

Nursing student awareness level of stroke warning signs was assessed using the 16-item ASWSQ based on decision-tree analysis model [22] modified by the research team. The respondents were allowed to answer "true", "false", or "don't know". Each correct answer received one point while incorrect answers received zero points. Respondents could receive a total of between 0 and 16 points, which was then converted into a percentage. Higher scores indicated higher levels of awareness of stroke warning signs. The Cronbach's alpha of the total ASWSQ was 0.84 [22] for the Korean version. In this study, the measures of internal consistency for stroke warning signs in the related questionnaire were yielded at a Cronbach's alpha of 0.81.

2.4.3. Nursing Student's Behaviors of First Responses to Strokes

Nursing student behaviors of first responses to strokes were assessed using the single-item BFRSQ with 5 choices based on the work done by Kim, Jeong and Kang [22]. Each correct answer received one point while incorrect answers received zero points. Higher scores indicated a greater ability to make appropriate first responses to strokes. The Cronbach's alpha for this section was 0.86 for the Korean version. In this study, the measures of internal consistency for behavior to take appropriate first responses to strokes in the related questionnaire were yielded at a Cronbach's alpha of 0.86.

2.4.4. Nursing Student's Ability to Specially Manage Stroke Patients

Nursing student ability to specially manage stroke patients was assessed using the 30-item BSMSQ, which was developed by the research team. The subjects were allowed to answer "true", "false", or "don't know". Each correct answer received one point while incorrect answers received zero points. Respondents could receive a total of between 0 and 30 points, which was then converted into a percentage. Higher scores indicated a greater ability to specially manage stroke patients. In this study, the measures of internal consistency for ability to specially manage stroke patients in the related questionnaire were yielded at Cronbach's alpha of 0.86.

2.4.5. Demographic Questionnaire

The nursing student demographic questionnaire was developed by the research team based on a review of existing literature. This questionnaire included questions on sex, age, student status, religion, marital status, and clinical experience.

2.5. Data Collection

A descriptive design was employed. After getting permission from the class teachers of two nursing colleges and at the end of selected classes, the researcher introduced the objectives of the study to the students. The self-administered questionnaires, small gifts and box were kept on a desk outside of the classroom. Students interested in participating in the study were invited to pick up a flyer or a set of questionnaires from outside of the classroom on a first-come, first-served basis. Participants needed approximately 20 minutes to complete the questionnaires. The students were instructed to drop the completed questionnaire into the box. Based on collection of the completed questionnaire from the box, 144 students were considered as eligible subjects who signed written informed consent form in this study. Students could be withdrawn participation at any time if they could wish to, with no risk to their educational opportunity or grades.

2.6. Data Analysis

Data were analyzed using SPSS version 21.0. Before conducting the analysis, the data were examined for outliers and missing responses. Data were analyzed using descriptive and inferential statistics. Correlational analysis between the scores

on the stroke awareness and stroke management behavior questionnaires was performed using Pearson's Product Moment Correlation Coefficients. One-way ANOVA tests and t-tests were used to determine the relationship between nursing students' demographic characteristics and their awareness of stroke and stroke management behaviors.

3. Results

3.1. Demographic Characteristics

Table 1 summarizes the participating students' demographic characteristics. The mean age of the students was 21.87 ± 0.75 years old with a range of 20 to 24 years old. Most of the students were between 20 and 22 years old (82.6%). The majority of the students were Muslim (86.1%) and a minority of them were Hindu (13.9%). The students were mostly female (93.8%). Most of them were single (97.9%). No student reported prior stroke management clinical experience, but all students had heard of strokes before.

3.2. Nursing Student's Awareness of Stroke Background Information

Nursing student awareness of stroke background information was sub-divided according to their awareness of stroke risk factors and stroke warning signs.

3.2.1. Nursing Student's Awareness of Stroke Risk Factors

Table 2 shows the frequency, percentage, mean, and SD of nursing students' scores in each category of awareness level of stroke risk factors. The majority of the students (59.1%) had a moderate or high level of awareness regarding stroke risk factors (M = 74.24, SD = 12.30) with a range of 45% to 100%. Very few of them had a low (8.3%) to a very low (16.7%) level of awareness of stroke risk factors. The least number of students (12.5%) had a high level of awareness of stroke risk factors.

Table 1. Demographic characteristics of participating students (N = 144).

Characteristics	Categories	n	%	M ± SD
Sex	Male	09	6.3	1.94 ± 0.24
	Female	135	93.8	
Age (years)	20 - 22	119	82.6	21.87 ± 0.75
	23 - 24	25	17.4	
Student type	4th year undergraduate	144	100	
Religion	Muslim	124	86.1	
	Hindu	20	13.9	1.14 ± 0.34
	Christian	00	0.0	
	Buddhist	00	0.0	
Marital status	Single	141	97.9	1.02 ± 0.14
	Married	03	2.1	

3.2.2. Nursing Student's Awareness of Stroke Warning Signs

Table 3 shows the frequency, percentage, mean, and SD of nursing students' scores in each category of awareness level of stroke warning signs. Most students (95.1%) had a low or very low level of awareness of stroke warning signs (M = 55.01, SD = 10.72) with a range of 31% to 81%. The least number of students had a moderate (1.4%) to high (0.2%) level of awareness of stroke warning signs.

3.3. Nursing Student's Stroke Management Behaviors

Nursing students' stroke management behaviors was sub-divided into behavior of first responses to strokes and special stroke patient management behaviors.

3.3.1. Nursing Student's Behaviors of First Responses to Strokes

Table 4 shows the frequency, percentage, mean and SD of nursing students' scores in each category for their behaviors of first responses to strokes. The results revealed that most of the students (75.7%) had a very low level of behaviors (M = 0.24, SD = 0.43) about the first responses that they should have to strokes. Very few (24.3%) of them showed a very high level of behaviors about the first response to strokes. A majority of the students (63.9%) had answered the questions incorrectly whereas a minority of them (35.4%) answered correctly.

Table 2. Frequency, percentage, mean, and SD of students' scores in each category of awareness level of stroke risk factors (N = 144).

Awareness Level of Stroke Risk Factors	n	%	M ± SD
Very low (<60%)	24	16.7	
Low (60% - 69.99%)	12	8.3	
Moderate (70% - 79.99%)	42	29.2	74.24 ± 12.30
High (80% - 89.99%)	43	29.9	
Very high (90% - 100%)	18	12.5	

Table 3. Frequency, percentage, mean, and SD of students' scores in each category of awareness level of Stroke Warning Signs (N = 144).

Awareness Level of Stroke Warning Signs	n	%	M ± SD
Very low (<60%)	91	63.2	
Low (60% - 69.99%)	46	31.9	
Moderate (70% - 79.99%)	02	1.4	55.01 ± 10.72
High (80% - 89.99%)	01	0.2	
Very high (90% - 100%)	-	-	

Table 4. Frequency, percentage, mean and SD of students in each category of behavior level of first responses to Strokes (N = 144).

Behaviors Level of First Responses to Strokes	n	%	M ± SD
Very low (<60%)	109	75.7	0.24 ± 0.43
Very high (90% - 100%)	35	24.3	

3.3.2. Nursing Student's Behaviors of Special Stroke Patient Managements

Table 5 shows the frequency, percentage, mean, and SD of nursing students' scores in each category of behaviors of special stroke patient managements. The findings showed that majority of the students (76.4%) had a low or a very low level of behaviors about special stroke patient managements (M = 62.11, SD = 9.75) with a range of 37 to 87. However, a small number of the students (17.4%) had a moderate level of behaviors and the least number of them (4.9%) had high level of behaviors about special stroke patient managements.

3.5. Behaviors of First Responses to Strokes, and Behaviors of Special Stroke Patient Managements (N = 144)

Table 6 shows the descriptive statistics about nursing students' awareness of stroke risk factors, awareness of stroke warning signs, behaviors of first responses to strokes and behaviors of special stroke patient managements. Nursing students' awareness of stroke risk factors had a mean score of 14.85 (SD = 2.46) with a range of 9 to 20. For awareness of stroke warning signs, the mean score was 8.80 (SD = 1.71) with a range of 5 to 13. For behaviors of first responses to strokes, the mean score was 0.36 (SD = 0.48) with a range of 0 to 1. For behaviors of special stroke patient managements, the mean score was 18.65 (SD = 2.98) with a range of 11 to 26.

3.5. Differences in Awareness of Stroke Risk Factors, Awareness of Stroke Warning Signs, Behaviors of Special Stroke Patient Managements According to Demographic Characteristics

Table 7 shows the differences in students' awareness of stroke risk factors, awareness of stroke warning signs, and behaviors of special stroke patient managements according to demographic characteristics. Muslim Students had a higher level of awareness of stroke warning signs (r = 0.35, p < 0.036) that non-Muslim students.

3.6. Relationship among Awareness of Stroke Risk Factors, Awareness of Stroke Warning Signs, and Behaviors of Special Stroke Patient Managements

Table 8 shows a significant positive correlation between nursing students' awareness of stroke risk factors and awareness of stroke warning signs (r = 0.247**, p = 0.004). Students' awareness of stroke risk factors was significantly negatively

Table 5. Frequency, percentage, mean, and SD of nursing students' behaviors of special stroke patient managements in each category (N = 144).

Behaviors Level of Special Stroke Patient Managements	n	%	M ± SD
Very low (<60%)	61	42.4	62.11 ± 9.75
Low (60% - 69.99%)	49	34.0	
Moderate (70% - 79.99%)	25	17.4	
High (80% – 89.99%)	07	4.9	
Very high (90% – 100%)			

Table 6. Descriptive statistics for nursing students' awareness of stroke risk factors, awareness of stroke warning signs, behaviors of first responses to strokes and behaviors of special stroke patient managements (N = 144).

Variables	Category	Total Item	Range
Awareness of Stroke Risk Factors	Stroke risk factors	14.85 ± 2.46	9 - 20
Awareness of Stroke Warning Signs	Stroke warning signs	8.80 ± 1.71	5 - 13
Behaviors of First Responses to Strokes	First responses to strokes	0.36 ± 0.48	0 - 1
Behaviors of Special Stroke Patient Managements	Special stroke patient managements	18.63 ± 2.92	11 - 26

Table 7. Descriptive statistics for awareness of risk factors, awareness of warning signs, and behaviors of special stroke management according to demographic characteristics (N = 144).

Characteristics	Categories	Risk factors (M ± SD)	Warning signs (M ± SD)	Special stroke management (M ± SD)
Age group	20 - 22 Years	14.93 ± 2.505	8.81 ± 1.732	18.64 ± 3.031
	23 - 24 Years	14.43 ± 2.233	8.75 ± 1.675	18.58 ± 2.394
Religion	Muslim	14.71 ± 2.457	8.64 ± 1.565	18.67 ± 2.990
	Non-Muslim	15.65 ± 2.390	9.80 ± 2.238	18.37 ± 2.521
First Responses to Strokes	Correct Behavior	14.88 ± 2.251	9.10 ± 1.876	19.12 ± 2.775
	Incorrect Behavior	14.81 ± 2.584	8.66 ± 1.609	18.35 ± 2.998

Table 8. Correlation between nursing students demographic characteristics with stroke related factors (N = 144).

Variables	Age	Religion	Risk Factor	Warning Signs	First Responses	Special Management
Age	1	−0.090	−0.181*	−0.162	−0.043	−0.032
Religion	−0.090	1	0.183*	0.143	0.036	−0.072
Risk Factors	−0.181*	0.183*	1	0.247**	0.043	0.139
Warning signs	−0.162	0.143	0.247**	1	0.090	−0.031
First Responses	−0.043	0.036	0.043	0.090	1	0.080
Special Management	−0.032	−0.072	0.139	−0.031	0.080	1

*$p < 0.05$, **$p < 0.001$.

correlated with their age (r = −0.181*, p = 0.033), meaning that younger students were less aware of stroke risk factors. Muslim students (r = 0.183*, p = 0.031) were more likely to be aware of stroke risk factors. No relationship between age, and awareness of stroke risk factors, awareness of stroke warning signs and behaviors of first responses to strokes and behaviors of special stroke patient managements were found.

4. Discussion

The purpose of this study was to explore fourth-year undergraduate nursing students' awareness of stroke and stroke management behaviors. The results of this study have shown that the majority of students have substantial gaps in their awareness of stroke-related information and special stroke patient management behaviors, but had a moderate level of awareness of stroke risk factors. Despite differences in educational settings, curricula, and practice environment between Korea and Bangladesh, the results of this study were consistent with the Korean study [22] in which fourth-year undergraduate nursing students' scores indicated moderate awareness of stroke risk factors (M = 76.49, SD = 12.77). A U.K. study [16] yielded similar results wherein most of the nursing students (91.5%) had a very low level of awareness about the risk factors for stroke.

The majority of the students in this study demonstrated a very low level of awareness of the warning signs of a stroke. This result was also consistent with the Korean study [22], which revealed that a majority of the participants had a low level of awareness about the warning signs of stroke (M = 34.72, SD = 12.75). A U.K. study of third-year nursing students showed that a majority of them had an unacceptable level of awareness about common stroke symptoms [16].

The possible reasons why the students in these studies may not have had higher levels of awareness of stroke risk factors and warning signs are that the content included in the curriculum did not convey up-to-date information about strokes, or that their work-based education was inadequate. These conditions might have precluded the students from reaching higher levels of cognitive and affective domains in terms of awareness of stroke risk factors and warning signs. Multifaceted stroke education is needed for nursing students to enhance their awareness of stroke risk factors and warning signs [22].

Nursing students were observed to have a very low level of behaviors of special stroke patient managements. In this study, nursing students' low level of behaviors of special stroke patient managements was correlated with their relatively low awareness of stroke warning signs and risk factors. These results are in accord with the KAP model's predictions [19], the findings from the Korean study, and the previous study conducted in the U.K. [16]. The U.K. study showed that 78% of students' awareness of stroke risk factors was largely incorrect, which decreased their clinical practice capabilities.

There are several possibilities for explaining this very low level of behaviors. First, students had inadequate time to study or were presented with little up-to-date stroke-related information in their curricula. The absence of a work-based education program to prepare students for their transition between theoretical and practicum courses was likely a large contributing factor to the students' very low level of stroke management behaviors. According to Edwards [15], nurses working with stroke patients often felt ill-prepared with their level of awareness in any setting or specialty when describing their pre-registration education.

This study found a statistically significantly positive correlation between nurs-

ing students' awareness of stroke risk factors and stroke warning signs (r = 0.247, p < 0.05). This relationship was similar with those found in the Korean study. The findings of the Korean study revealed the positive correlation between awareness of stroke risk factors and awareness of stroke warning signs with behaviors of first responses to strokes and special stroke patent managements behaviors. However, this study found no such connection. Students' age was negatively correlated with their awareness of stroke risk factors, which was not found by the Korean study. Muslim students had higher awareness of stroke risk factors, which was not found by the Korean study. The U.K. and Korean studies found the same relationships between students' awareness of stroke risk factors and stroke management behaviors.

The students' inadequate awareness of stroke risk factors and warning signs was reflected in their very low level of behaviors of special stroke patient managements [16]. The Korean study similarly found that adults with low to moderate awareness of stroke risk factors and warning signs had significantly poorer ability of how to react to strokes [22].

Overall, in accordance with the KAP model's predictions, nursing students with low awareness of stroke risk factors and stroke warning signs also had a low behavior of stroke patient management. No significant correlation was found between age, awareness of stroke risk factors, and awareness of stroke warning signs and behaviors of stroke management. This result may have been due to an absence of updated information on stroke management in the students' curricula or lack of practicum preparation.

4.1. Implications

The outcomes of this study have implications for nursing education, practice, and future research in Bangladesh. It provides baseline data for current curriculum performance that curriculum committees can use to redesign nursing curricula to better educate nursing students about strokes. Work-based educational programs could help nursing students enhance their awareness of and behaviors regarding stroke.

4.2. Opportunities for Further Studies

Replication of this study in other settings is recommended to promote the generalizability of the findings above. A further study of stroke educational programs should be conducted to examine students' awareness of and behaviors regarding stroke.

4.3. Study Limitations

The main limitation of this study was that it used a self-reporting questionnaire to examine nursing students' awareness of and behavior regarding strokes management. So the responses might not reflect actual stroke management behaviors. The generalizability of the study results is compromised by the small sample size and the fact that it sampled only two university populations.

5. Conclusion

A descriptive study was conducted to explore the level of fourth-year undergraduate nursing students' awareness and behavior regarding strokes. The relationships between these variables were examined. The findings showed that students had moderate awareness levels of stroke risk factors, but very low awareness levels of stroke warning signs. The results also indicated that students had obtained very low levels of behaviors of first responses to strokes and special stroke patient managements behaviors. It can be reasonably assumed that nursing students' inadequate stroke awareness was reflected in their poor execution of stroke management. Work-based education is a necessary part of nursing curricula to increase nursing students' awareness and behaviors regarding strokes as part of their practicum preparedness.

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Psychometric Evaluation of the Japanese Wijma Delivery Expectancy/Experience Questionnaire Version B

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Abstract

The Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) is a widely accepted approach to measuring fear of childbirth and is available in two versions: antenatal (version A) and postnatal (version B). The aim of this study was to develop the Japanese W-DEQ version B and confirm its validity and reliability among Japanese women. A self-administered questionnaire incorporating the translated Japanese W-DEQ (JW-DEQ) version B and the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS) was distributed to Japanese mothers at two days postpartum. Of the 246 women recruited, 231 who completed the questionnaire at two days postpartum were analyzed. An exploratory factor analysis of the JW-DEQ version B revealed four factors: fear, lack of positive anticipation, isolation and riskiness. The JW-DEQ version B exhibited a positive correlation with the HADS anxiety subscale (r = 0.34, p < 0.001). The Cronbach's α value derived from the total 33 items was 0.95. This study provides evidence of the factorial, concurrent validity and the internal consistency of the JW-DEQ version B. However, a further study involving participants from different demographic groups will be required.

Keywords

Japanese Women, Reliability, Scale Development, Postnatal Fear of Childbirth, Validity

1. Introduction

Women may have both positive and negative recognition giving birth. A negative experience caused by fear during birth (postnatal fear of childbirth) [1] includes concern about pain, unexpected complications such as a difficult course of labour, emergency Caesarean section, isolation during labour and loss of control [2]. Women are afraid of pain and the uncertainty of the delivery process (fear), leading to worry about being in an uncontrollable situation and alone (isolation), which can lower their confidence and evoke a sense of failure [2]. Another concern is the possible risks to their own health, such as bleeding or obstetric interventions, or to the health of their child, for example, physical injury or severe distress (riskiness) [3].

When women experience severe fear during birth, childbirth is often described as "being in an unavoidable situation without return, which was demanding for both control and loss of control" or as an "uncontrollable situation not in agreement with the expectation", which generates a long term negative memory of the birth experience [3]. Such women are more likely to exhibit emotional irritability and may have postnatal traumatic stress symptoms [4]. These women suffer involuntary flashbacks of the traumatic birth (Intrusion) in their daily life or have nightmares related to birth, making them try to avoid situations or thoughts that remind them of the birth [5]. In addition, they might also experience difficulty recalling key features (alterations in arousal) and have a persistent negative feeling about themselves and others [5]. Furthermore, it has been reported that women who had a negative and traumatic experience of childbirth are reluctant to have another child [6]. Therefore, assessing mothers' experience of *"fear of birth"* in the early stage of the postpartum period and providing appropriate support are very important for life after discharge from the hospital.

One of key factors in severe fear of childbirth is an "abnormal course of delivery", such as an emergency Caesarean section, vacuum delivery, induced delivery or foetal distress during labour, all of which increase postnatal fear of childbirth [7]. Another key factor might be a severe fear of childbirth during pregnancy. The present authors examined the association between antenatal and postnatal fear of childbirth, taking birth related factors (duration of labour, instrumental delivery and emergency Caesarean section) into account by means of Structural equation modelling (SEM) [8]. The results revealed that antenatal fear of childbirth was the most significant predictor of postnatal fear of childbirth (Primiparas: $\beta = 0.58$, p = 0.002; Multiparas: $\beta = 0.62$, p < 0.001). Because there are only a few cases of emergency Caesarean section in the study, we are unable to prove that antenatal fear of childbirth is the most significant predictor. However, our findings demonstrated that pregnant women who are severely afraid of the upcoming childbirth are more likely to consider their childbirth experiences more frightening than others, even when the course of delivery is normal [8]. Thus, the result indicated that it may be essential to identify and support pregnant women with severe fear of childbirth in order to reduce the risk of emo-

tional disorders during the postnatal period [8]. Assessing postnatal fear of childbirth would not only be helpful for early detection of a negative birth experience caused by abnormal delivery but also for evaluating antenatal and intrapartum midwifery care in clinical settings.

Because of the lack of a Japanese scale that can assess both antenatal and postnatal fear of childbirth, we began developing validated Japanese scales in 2011. The Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) [1], which has been validated in English, Italian and Turkish besides the original Swedish version, is widely used in several countries [9] [10] [11]. The W-DEQ comprises two versions: version A, which assesses antenatal fear of childbirth (expectations), and version B, which assesses postnatal fear of childbirth (experience) [1]. To the best of our knowledge, the W-DEQ version B is a validated and reliable measure in other language versions [9] [10] [11]. The scale demonstrates high concurrent validity, a significant correlation with anxiety, depression and neuroticism [9] [11], as well as high internal consistency (Cronbach's α = 0.87) [1] [9]. However, most researchers use the W-DEQ version B without examining its factor structure because they consider that the psychometric structure of version A and B is homogenous (fear, lack of anticipation, isolation and riskiness) due to the items being identical [1] [11]. Only one study [12] contained a factor analysis that revealed the six factor structure of the Turkish W-DEQ version B (concerns about pain, lack of positive behaviours, loneliness, lack of positive feelings, concerns about childbirth and concerns about the baby) [1]. Because no previous study examined the psychometric aspects of the Japanese W-DEQ version B, information concerning the validation of the scale would provide more evidence that the W-DEQ can serve as a standard measure.

The aim of the present study was to develop the Japanese W-DEQ version B and explore its validity and reliability among Japanese women.

2. Methods

2.1. Translation and Comprehensiveness

We translated the W-DEQ version B into Japanese in accordance with the guidelines presented by Wild *et al.* (2005) [13]. First, forward translation from the original Swedish into Japanese was made by a qualified translator, who is a native Japanese proficient in the Swedish. The appropriateness of the translated text in a Japanese cultural context was then discussed by the Japanese researchers, who have a midwifery background. If any reformulation was deemed necessary, the forward translator was requested to revise the item in question. Second, back translation from Japanese into Swedish was made by two different Japanese translators who are also proficient in the Swedish language. The researchers then examined the similarity between the original and back-translated Swedish versions to determine the accuracy of the translation. Third, a pilot test was conducted to explore possible alternative formulations, as well as confirm the understand ability of the scale and the accuracy of its interpretation. Ten pregnant women who were 37 gestational weeks at an obstetric clinic in Tokyo were asked

to fill in the questionnaire (July, 2011). The total time required to fill in the scale ranged between three and seven minutes. Finally, the researchers asked the original author for approval of the translation process and the final JW-DEQ version B.

2.2. Study Protocol

The present study was conducted in parallel with the translation of the JW-DEQ version A [14]. Healthy Japanese women at 37 gestational weeks were recruited between July and November 2011 at an obstetric clinic in Tokyo. The clinic only provides delivery without anaesthesia. Women can choose their preferred birth position during labour. The exclusion criteria were; inability to understand Japanese, teenagers and women hospitalised due to a major complication, who require special ethical consideration. Cases of planned Caesarean section were excluded because the original W-DEQ is not suitable for women who did not experience labour. Two hundred and forty six women were invited to participate by a researcher (M.T.) at the outpatient department. A total of 240 agreed and filled (97%) in the first questionnaire at 37 weeks gestation [14]. Sociodemographic information including age, educational background, in addition to medical information such as a history of mental disorders, complications during pregnancy (pregnancy-induced hypertension, threatened premature labour and placenta praevia) and foetal anomalies (intrauterine growth restriction and foetal malformation) were collected from their medical record. On the second day postpartum the participants were given another questionnaire by the researcher (M.T.) to assess the validity and reliability of the JW-DEQ version B. With regard to subjective birth experiences, as most women synthesize their childbirth experiences on around the third day after delivery when they recover from the physical fatigue caused by childbirth [15], the authors considered the third day to be the best time to ask the mothers to fill in the questionnaire. A maximum of 15 minutes was required to fill in the first questionnaire, including the psychological scales to examine the validity of the W-DEQ version A [14]. The time required for the second questionnaire was five minutes.

2.3. Psychometric Measures

2.3.1. JW-DEQ Version B

Postnatal fear of childbirth (experience) was assessed by the JW-DEQ version B [1] [14], which comprises 33 items rated on a six-point scale; "Not at all" (0) to "Extremely" (5). The total score ranges from 0 to 165. Higher scores show a greater degree of fear, with scores over 85 indicating severe fear of childbirth [1]. The Cronbach's *a* value was 0.95 as stated by Wijma *et al.* (1998) [1].

2.3.2. The Hospital Anxiety and Depression Scale (HADS)

General symptoms caused by dysphoric mood were assessed by the Hospital Anxiety and Depression Scale (HADS) [16] [17]. The HADS comprises 14 items with two subscales: the anxiety subscale (seven items) and the depression subscale (seven items). The HADS is a valid and reliable measure for assessing gen-

eral anxiety and depression without considering physical symptoms [16], which might be due to hormonal change during the postnatal period. As the HADS contains less items for assessing anxiety and depression than other validated measures such as the Spielberger State Trait Inventory (STAI, 20 items) [18], the authors decided to use it in order to minimize the effort required by the mothers at early postpartum. The items in each subscale were on a four-point scale ranging from "strongly disagree" (1) to "strongly agree" (4) yielding possible scores from seven to 28, with a higher score indicating a greater level of general anxiety and depression. Because fear is defined as "the unpleasant emotional state consisting of psychological and psychophysiological responses to a real external threat or danger [19]", fear and anxiety are similar in meaning. Therefore, it can be hypothesized that the JW-DEQ version B has a moderate correlation with the HADS anxiety subscale. In this study, the HADS anxiety subscale was used for concurrent validation. The Cronbach's α was 0.73 for the anxiety subscale in the present study.

2.4. Statistical Analysis

A minimum sample of 165 women is required to provide the necessary five to ten cases per item for an exploratory factor analysis (EFA) [20]. The factor structure of the total number of items was explored by means of EFA and the robust maximum likelihood estimation procedure employed. Firstly, the factors with eigenvalues above one were identified by means of scree plots. Secondly, a promax rotation was performed.

The total and factor scores of the JW-DEQ version B and the HADS subscale scores were correlated by means of the Pearson product-moment correlation coefficients (concurrent validity). The correlation coefficient (r) scores were classified as weak (0.10 - 0.29), moderate (0.30 - 0.49), or high (0.50) [21]. The Cronbach's α coefficient was calculated (internal validity) and 0.7 was set as a minimum criterion for acceptance [22]. All tests were two-tailed and *P*-values of 0.05 were deemed statistically significant. The SPSS version 22.0 was used for analyses.

2.5. Ethical Approval

The study was approved by the Ethics Committee of the Graduate School of Medicine at the University of Tokyo, Tokyo, Japan (No. 3417, 2011). All participants were informed about the study, assured of anonymity and confidentiality, as well as the fact that they could withdraw at any time by making a written request.

3. Results

3.1. Characteristics of Participants

Table 1 presents the characteristics of the participants. Two hundred and thirty-three women out of the 240 who agreed to participate (96%) returned the questionnaire early postpartum. Excluding two participants whose data was one

missing of the JW-DEQ version B item, 231 were analyzed (primiparas, n = 115, multiparas, n = 116). Their average age was 32 years (standard deviation [SD] = 3.98). The majority (n = 139, 60%) had graduated from university. Six out of the 231 women (2%) had a history of depression or panic disorder but were not on medication at the time of the study. Seven women had an emergency Caesarean section (3%), 15 women had a vacuum delivery (6%) and 58 women had an induced delivery (25%). The average score of version B in the present study was 53.06 (SD = 28.58). In primiparas, the average score of version B was 63.78 (SD = 27.33), while in multiparas it was 42.3 (SD = 25.75) (*p* < 0.001).

3.2. Factorial Validity

The EFA (Table 2) revealed a four-factor structure, which is presented visually by means of a scree plot, although five factors had an eigenvalue greater than

Table 1. Participants' characteristics.

	Total (n = 231)		Nulliparas (n = 115)		Multiparas (n = 116)		p-value	
	Mean ± SD or n (%)		Mean ± SD or n (%)		Mean ± SD or n (%)			
Demographic data								
Age	32.97	±3.98	32.01	±4.10	33.94	±3.75	<0.001	a
Education high school	16	(7)	6	(5)	10	(8)	0.653	b
College	76	(33)	41	(35)	35	(30)		
University	139	(60)	69	(60)	70	(60)		
Planning to deliver with family	225	(97)	112	(97)	113	(97)	0.512	b
History of psychiatric disorders	6	(3)	4	(3)	2	(2)	0.252	c
Complexity of pregnancy	37	(16)	20	(17)	17	(15)	0.375	b
Anomalies in development of foetus	7	(3)	4	(3)	3	(3)	0.363	c
Birth outcomes								
Duration of labour (h)	6.37	±4.57	8.00	±5.09	4.00	±3.00	<0.001	a
Emergency Caesarean Section	7	(3)	7	(6)	0	(0)	0.010	c
Vacuum delivery	15	(6)	11	(9)	4	(3)	0.100	c
Induced delivery	58	(25)	47	(41)	11	(9)	<0.001	b
Measures								
JW-DEQ[1] version B	53.28	±28.73	64.25	±27.42	42.30	±25.75	<0.001	a
HADS[2] anxiety	2.50	±2.48	2.86	±2.52	2.14	±2.39	0.028	a

[1]The Japanese version of the Wijma Delivery Expectancy/Experience Questionnaire (33 items, scored 0 - 165); [2]The Hospital anxiety and depression scale (Anxiety: 7 items, scored 0 - 21; Depression: 7 items, scored 0-21); [a]Student's t test, [b]Chi-squired test, [c]Fisher's exact test, Statistical significance: p < 0.05.

Table 2. Factor loadings of the JW-DEQ version B.

		Factor 1 Fear	Factor 2 Lack of positive anticipation	Factor 3 Isolation	Factor 4 Riskiness
16	Composed[R]	**0.97**	−0.04	−0.05	−0.15
25	Behave badly	**0.92**	−0.13	0.00	−0.16
19	Panic	**0.85**	−0.15	−0.05	0.02
17	Relaxed[R]	**0.74**	0.20	−0.11	−0.16
5	Confident[R]	**0.72**	0.02	0.06	−0.04
22	Self-confidence[R]	**0.69**	0.13	0.06	0.05
27	Lose control of myself	**0.68**	−0.15	0.17	−0.12
24	Pain	**0.66**	0.16	−0.07	−0.08
10	Independent[R]	**0.61**	0.12	−0.05	−0.01
4	Strong[R]	**0.60**	0.14	0.11	−0.14
8	Weak	**0.53**	−0.07	0.31	0.12
2	Frightful	**0.50**	0.09	0.09	0.22
23	Trust[R]	**0.46**	0.10	0.21	0.21
12	Tense	**0.42**	−0.17	−0.03	0.34
6	Afraid	**0.40**	−0.06	0.12	0.38
20	Hopelessness	**0.37**	0.14	0.22	0.17
31	Dangerous	**0.33**	0.21	−0.05	0.31
14	Proud[R]	−0.19	**0.93**	0.14	−0.13
13	Glad[R]	−0.15	**0.80**	0.27	−0.14
18	Happy[R]	0.10	**0.71**	0.15	−0.09
29	Natural[R]	0.17	**0.58**	−0.20	0.25
1	Fantastic[R]	0.05	**0.56**	−0.10	0.01
21	Longing for the child[R]	−0.08	**0.54**	0.14	0.00
30	Self-evident[R]	0.23	**0.52**	−0.27	0.18
28	Enjoyable[R]	0.40	**0.47**	−0.13	0.03
26	Allow my body to take control[R]	0.28	**0.29**	−0.06	0.02
15	Abandoned	0.00	−0.07	**0.67**	0.00
3	Lonely	0.02	0.15	**0.64**	−0.01
7	Deserted	0.16	0.03	**0.64**	−0.07
11	Desolate	−0.09	0.08	**0.54**	0.21
33	Child will die	−0.26	−0.04	0.12	**0.89**
32	Child will be injured	−0.12	−0.04	−0.05	**0.88**
9	Safe[R]	0.14	0.20	−0.02	**0.22**
	Variance (%) total	39.5	6.8	5.4	5.3

Maximum Likelihood Method, Promax rotation. R: Reverse item.

one according to the Kaiser-Guttman rule [23]. The four factors; "fear, isolation, lack of positive anticipation and riskiness" [10] detected in previous studies were similarly identified among Japanese women in the present study. The cumulative variance explained by these factors was 57.0%. The factor loadings of three items were less than 0.3: "dangerous" (item 31), "allow my body to take control" (item 26) and "safe" (item 9). These items also loaded on more than two factors such as fear, isolation and riskiness. Some of the items in the JW-DEQ version B loaded onto different factors than those in the JW-DEQ version A: "weak" (item 8), "safe" (item 9), "hopelessness" (item 20), "natural" (item 29) and "dangerous" (item 31). The four-factor structure was found among both primipara and multipara mothers.

3.3. Concurrent Validity

Table 3 presents the results of the Pearson's correlations between the JW-DEQ version B and the HADS anxiety subscale. The total score of the JW-DEQ version B was moderately correlated with the HADS anxiety subscale ($r = 0.34$, $p < 0.001$), indicating satisfactory concurrent validity.

3.4. Internal Consistency

The Cronbach's α of the total JW-DEQ version B was 0.95. However, the Cronbach's α of the riskiness factor items was only 0.65 (Table 4).

4. Discussion

In the present study, the Japanese W-DEQ version B (JW-DEQ version B) was developed to assess Japanese mothers' experiences related to fear of childbirth in the postnatal period. The factorial and concurrent validity, as well as the internal consistency (reliability), were explored. The main results indicated that the

Table 3. Pearson's product correlation coefficient(r).

	JW-DEQ[1] version B		Factor 1 Fear		Factor 2 Lack of positive anticipation		Factor 3 Isolation		Factor 4 Riskiness	
HADS[2]	0.34	**	0.32	**	0.25	**	0.22	**	0.35	**

*p < 0.05, **p < 0.001; [1]The Wijma Delivery Expectancy/Experience Questionnaire Japanese version B (33 items: 0 - 165 scores); [2]The Hospital Anxiety and Depression Scale anxiety subscale (7 items: 0 - 21 scores).

Table 4. Cronbach's α.

	Cronbach's α
JW-DEQ[1] version B total	0.95
Factor 1: Fear	0.93
Factor 2: Lack of positive anticipation	0.87
Factor 3: Isolation	0.74
Factor 4: Riskiness	0.65

[1]The Wijma Delivery Expectancy/Experience Questionnaire Japanese version B (33 items: 0 - 165 scores).

JW-DEQ version B has four factors: fear, lack of positive anticipation, isolation and riskiness. The JW-DEQ version B was also found to have good concurrent validity with the HADS anxiety scale and high internal consistency for the total scale. However, some of the items only weakly described one of the factors as indicated by the low factor loadings (<0.3); therefore, reconsideration of the items may be necessary in the future.

The JW-DEQ version B has the same factor structure as version A: fear, lack of positive anticipation, isolation and riskiness [14]. In addition, both primipara and multipara groups have the same factor structure. With regard to other language versions of the W-DEQ version B, we could not find any research paper reporting the results of a factor analysis.

In previous studies, the factorial validity was rarely investigated. Wiklund *et al*. (2008) reported having the same four factors as the W-DEQ version B, which is consistent with this Japanese version [11]. Kukulu *et al*. (2016) compared four and six factor structures by means of confirmatory factor analysis, demonstrating that the six factor model is the best fit [12]. However, the six factors were originally selected by the Kaiser-Guttman rule (eigenvalue >1), which is not recommended for determining the number of factors [24] for the following reasons; First, this method is recommended for the principal component analysis (PCA) case and not for the EFA. Second, this method can lead to subjective decisions and third, it has a high tendency to overestimate the numbers [24]. Although a scree plot has a limitation in terms of its subjectivity, it is considered more suitable than the Kaiser method [25]. In addition, the data in the present study did not have six factors greater than one of the EFA eigenvalues. Thus, the four factor solution based on the scree plot method is considered valid in this study. Therefore, the present study is the first to confirm the psychometric properties of the JW-DEQ version B and find support for the factorial validity.

It is interesting that some items of the JW-DEQ version B loaded onto different factors than those of the JW-DEQ version A [14]: "weak" (item 8), "safe" (item 9), "hopelessness" (item 20), "natural" (item 29) and "dangerous" (item 31). "Weak" (item 8) and "hopelessness" (item 20) loaded onto the fear factor in version B, whereas in version A they loaded onto the isolation factor [14]. "Natural" (item 29) loaded onto lack of positive anticipation in version B but fear in version A. "Safe" (item 9) loaded onto riskiness in version B but lack of positive anticipation in version A. Finally, "dangerous" (item 31) loaded onto fear in version B but riskiness in version A. These results suggest that some mothers may interpret their fear about childbirth differently before and after delivery, possibly reflecting a gap between expectation and experience before/after childbirth. Mothers in a Japanese cultural context expect their forthcoming childbirth to be adequately supported by family and professionals. "Weak" (item 8) and "hopelessness" (item 20) may indicate a mother's concern about being in a situation without sufficient support from others. However, these interpretations may change from an external expectation of support from others (version A) to internal self-reflection on one's own vulnerability when facing the reality of la-

bour and uncontrollable situations (version B).

In addition, "natural birth" is described both as "a birth without any medical intervention and "birth achieved by a mother's spontaneous power in collaboration with the unborn baby", which is deemed an optimal childbirth by Japanese mothers [26] [27]. Although women might be afraid if they have to undergo a medical intervention before delivery (version A), they may interpret "natural" as achieving a successful outcome as a result of their own confidence and strength. Two items did not obtain factor loadings of >0.3: allow my body to take control (item 26) and safe (item 9). These items may also be ambiguous in terms of interpretation. Considering that these items cross-loaded onto various factors in both version A and B [14] (Table 2), they may not clearly explain any of the factors in either version. However, we retained them for the following reasons: First, the sample might be inadequate because it was small and the study was conducted in only one clinic. Second, to confirm the suitability of the JW-DEQ version B as a standard measure of fear of childbirth, it should be compared with the scores of the W-DEQ version B in other countries.

Furthermore, the riskiness factor of the JW-DEQ version B comprises only three items ("child will die" [item 31], "child will be injured" [item 33] and "safe" [item 9]). A factor that does not include at least three items will have insufficient degrees of freedom for defining a latent factor [28]. Although the factor meets Costello and Osborne's criterion, it might only weakly explain riskiness because the factor loading for safe (item 9) is low (0.22) [28].

Regarding concurrent validity, the JW-DEQ version B showed a weak correlation with the HADS anxiety subscale, which was expected (Table 3). The concurrent validity was therefore confirmed. Furthermore, because the Cronbach's α value of the total 33-item scale was above 0.7, the internal consistency of the JW-DEQ version B is good. However, the Cronbach's α of the riskiness factor was lower than the acceptance criterion (0.7), which again may be because of the poor factor loading of safe (item 9).

Our study has some limitations. First, it was conducted in only one setting in Tokyo and the women enrolled were healthy. Compared with the 2010 national data [29], the age and educational background of our sample was higher. Therefore, the findings should be interpreted with caution. The inclusion of younger women who live in other districts would be necessary to ensure greater generalizability of the results. Although our participants were relatively healthy, they included women with a broad range of ages, educational backgrounds and delivery modes. Second, the riskiness factor is assumed to be unstable because it only contains three items and item 9 (safe) had poor factor loadings. Considering that the riskiness factor was weak in both the Japanese and the English W-DEQ [10] [14], future studies may need to reconsider the factor items. Third, confirmatory factor analysis was not conducted due to the limited sample size. Further examination of the JW-DEQ version B among a larger population with more diverse demographic characteristics is required.

Although several limitations stated above, this is the first study which revealed

the evidence regarding validity and reliability of the JW-DEQ version B. The scale would be helpful for health care providers to assess woman's birth experience properly. However, we must point out the need for some caution when using the JW-DEQ version B. First, using the total score of the 33 items or employing semi-structured modelling to form the latent variables of factors instead of using each factor scores is recommended, because the factors revealed in this study were correlated. Second, our finding that some items loaded onto different factors in versions A and B suggests that they should be regarded as totally different measures. Therefore, in contrast to some earlier studies we recommend that the scores of version A and version B should not be compared. Future studies aimed at reconsidering the items in the Swedish, English and Japanese versions in collaboration with the original Swedish and Norwegian researchers would facilitate the development of a more validated and standardized measure.

5. Conclusion

The findings of the present study support the initial validity and reliability of the JW-DEQ version B among Japanese mothers as a scale for measuring fear of childbirth in the postnatal period.

Acknowledgements

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Translation and Validation of the Taiwanese Version of the Self-Efficacy for Appropriate Medication Use Scale

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Abstract

Aims and objectives: To translate and validate a Taiwanese version of the Self-Efficacy for Appropriate Medication Use Scale (SEAMS). **Background**: The major barrier in the management of atrial fibrillation is the lack of self-efficacy to medications adherence. Patients' knowledge of the nature of atrial fibrillation and cardiovascular, cerebrovascular risk factors and anticoagulants is a significant factor affecting individuals' adherence. However, few instruments have been developed to assess patients' self-efficacy to medications adherence and none has been translated into Taiwanese. **Design**: This study used a standard "forward-backward" procedure, which was used to translate SEAMS into Taiwanese language. Reliability was tested for internal consistency. Validity was confirmed using criterion-related validity. **Methods**: Data collection for this research occurred from October 13, 2015 to October 26, 2016. The sample included atrial fibrillation outpatient. Participants simultaneously completed the Taiwanese version of the Self-Efficacy for Appropriate Medication Use Scale (SEAMS-T). A total of 151 individuals completed the questionnaire. **Results**: Coefficient alpha was 0.931 for atrial fibrillation patients. **Conclusions**: Findings provide support for the validity of the Taiwanese version of the Self-Efficacy for Appropriate Medication Use Scale (SEAMS-T). **Relevance to clinical practice**: The translation and validation of an instrument evaluating the self-efficacy for medication adherence in atrial fibrillation contribute to assessing the provided educational intervention.

Keywords

Atrial Fibrillation, Adherence, Self-Efficacy

1. Introduction

Atrial fibrillation is the most common type of arrhythmia [1] [2]. In the adult population of the world, the lifetime risk of atrial fibrillation probability is around 20% - 25%, which is similar to the white and the Chinese [3]. According to the recently published 2010 global disease burden study (Burden of diseases Global 2010 study), the estimated global prevalence of atrial fibrillation was 33.5 million in 2010, including 20.9 million men and 12.6 million women [4] [5] [6]. But these numbers may be underestimated because many asymptomatic atrial fibrillation patients may not be examined [4] [6].

Approximately 2.7 to 6.1 million people are affected by atrial fibrillation in the United States, and this number is expected to increase [7]. People under the age of 65 who suffer atrial fibrillation are about 2%, and people aged 65 or above suffering atrial fibrillation were about 9%. Because atrial fibrillation increases with age and women generally live longer than men, so there are bigger risks for atrial fibrillation in women than men [7].

According to the study of several Asian teams, the prevalence of atrial fibrillation in Asia is about 1% of the adult population, lower than white people (about 2%) [8]. Half of the world's population lives in Asia, and the elderly population in Asia has also increased rapidly [9]. Thus, the burden of atrial fibrillation in Asia is bound to become bigger than ever. In 2050, there will be 72 million atrial fibrillation patients in Asia. This number is bigger than that of patients from Europe and the United States [10]. According to the research in Taiwan, the incidence of atrial fibrillation was 1.68 per 1000 people a year in male and 0.76 per 100 people a year in female. The overall prevalence of atrial fibrillation in Taiwanese is 1.4% in male and 0.7% in female [11]. The prevalence and incidence of atrial fibrillation increased substantially with age [11].

Atrial fibrillation causes 15% - 20% of chances to suffer ischemic strokes [12] [13], which occur when blood flowing to the brain is blocked by a clot or by fatty deposits called plaque in the blood vessel lining [12]. Compared with those without atrial fibrillation, the risk of stroke in patients with atrial fibrillation increased by four to five times, and stroke which is caused by atrial fibrillation is often more severe than other causes of stroke [12]. More than 750,000 hospitalizations occur each year because of atrial fibrillation. The condition contributes to an estimated 130,000 deaths every year. The death rate from atrial fibrillation as the primary or a contributing cause of death has been rising for more than two decades [14].

Compared with patients without atrial fibrillation, atrial fibrillation patients had three to four times risk of stroke in Asia [11] [15] [16]. The annual risk of atrial fibrillation associated stroke in Taiwan has recently been explored. According to the National Health Insurance Research Database of the whole Taiwanese population, the annual risk of stroke of 185,570 atrial fibrillation patients did not receive any antiplatelet or oral anticoagulant [17].

Atrial fibrillation increases an individual's risk of stroke, heart failure, and other heart-related complications [7] [12]. According to the data from Taiwan

Stroke Registry, only 28.28% of people with atrial fibrillation take warfarin, but there are as high as 90% of patients who meet the criterion and need to take warfarin [18]. The usage of the new oral anticoagulants (e.g. dabigatran, rivaroxaban, apixaban) on patients with atrial fibrillation has better pharmacological effect than warfarin does [19]; nevertheless, warfarin is still the standard treatment of oral anticoagulants for the prevention of stroke in atrial fibrillation [19]. In addition, choices for the proper anticoagulation therapy are based on the risks of thrombosis and abnormal bleeding patients will take, and other clinical factors, including the control of warfarin, drug interaction, adherence, safety of different drug dosage, and individual coagulation monitoring, etc. Therefore, providing knowledge of the usage of anticoagulants for patients with atrial fibrillation can enhance their adherence of using anticoagulants.

The reasons why only a small proportion of patients with atrial fibrillation in Taiwan use warfarin include that they are afraid of taking blood tests regularly, and they are tired of coming back to the clinic, taking blood tests, and getting a revised dosage of medication frequently. Also, they are worried about the side effects of medications, using secret recipes for clearing blood vessels from neighbors without authorization, or turning to famous doctors. All these phenomena mentioned above show that patients with atrial fibrillation in Taiwan have poor adherence of treatment. Thus, focusing more attention on finding out what patients need or what they are confused about, and explaining principles of treatment and methods of medication uses to them is the only way to reach effective prevention.

Disease management of patients with atrial fibrillation aims at reducing symptoms and preventing complications associated with atrial fibrillation, and anticoagulants are able to prevent complications related to atrial fibrillation [20]. However, warfarin and other anticoagulants are used less than recommended in clinical guidelines. This under use results from health care provider obstacles and often groundless safety concerns. Additionally, poor adherence to the anticoagulation regiments can also result in increased risk of stroke or abnormal bleeding.

The term "adherence" is defined as "the extent to which a person's behavior-taking medication, following a diet, and executing lifestyle changes, corresponds with agreed recommendations from a health care provider" [21]. WHO points out that adherence is a multidimensional phenomenon formed by the interactions among five factors, including social and economic factors, health care team and system-related factors, condition-related factors, patient-related factors, and therapy-related factors, all of which are explained respectively as follows [21]. Adherence is related to people's knowledge and beliefs of their illness, motivation to manage it, confidence or self-efficacy in their ability to engage in illness-management behaviors, expectations regarding the outcome of treatment, the consequences of poor adherence, and insufficient understanding of the treatment or their illness [21].

In addition to health beliefs, self-efficacy beliefs also motivate an individual to

adopt a healthy way of living [22] [23]. Hence, here refers to Social Cognitive Theory (SCT) held by Bandura [24], and agrees with the concept of self-efficacy that only when people show confidence in their abilities to make changes can they really make long-term changes that they wish for. This concept enhances the strength of explanation made by health belief model for long-term behavior changes.

The Self-efficacy for Appropriate Medication Use Scale (SEAMS) provides assessment of medication self-efficacy in the object of study's use of anticoagulants [25]. The instrument contains 13 questions, which mainly focusing on the patients' opinions on their medication. It is a Three-Point Likert Scale, in which 3 means "very confident", 2 meaning "somewhat confident", and 1 meaning "not confident". The potential score ranges from 13 to 39, and higher scores indicate higher levels of self-efficacy for medication adherence. Risser, Jacobson and Kripalani tested 436 patients with coronary artery diseases [25]. The test result reveals internal consistency with a Cronbach's alpha of 0.89 and the test-retest reliability of 0.57; in the respect of criterion-related validity, self-efficacy is strongly correlated with medication adherence as assessed by the Morisky scale (Spearman's r = 0.51, p = 0.0001) [25]. The researcher has gained the approval of translation into Chinese from the original author.

The aim of the present study was to validate the SEAMS in Taiwanese adults with atrial fibrillation. The importance of this study is to translate and validate the scale into Taiwanese, since this would provide the applicability and relevance of an instrument in the Taiwan population. Furthermore, scientists will have the ability to design surveys, giving important findings about the role of healthcare system. In addition, the study allows healthcare providers to assess the provided educational intervention.

2. Methods

2.1. Design

The study design was cross-sectional. This study was undertaken as a part of a study to evaluate an educational intervention, improving adherence to atrial fibrillation among Taiwanese adults. We used the SEAMS which was translated into Taiwanese and was then administered to participants.

2.2. Participants and Setting

This study was conducted at two teaching hospitals in Taiwan, from October 13, 2015 to October 26, 2016. They provide health care, emergency treatment for patients with all illnesses and accidents, and primary and advance medical healthcare.

The inclusion criteria for atrial fibrillation were the following: 1) age of 20 and above, 2) be proficient in Mandarin and Taiwanese, 3) the doctor diagnosed patients with atrial fibrillation, and 4) patients who use anticoagulants (warfarin or NOACs) participate. The exclusion criteria for atrial fibrillation were the following: 1) patients diagnosed with mental illnesses, 2) patients with instability

and uncontrolled hypertension, 3) patients with heart failure (NYHA stage IV), 4) installed pacemaker, AICD for patients, 5) patients with cardiac surgery in the last three months, and 6) patient who only has the last three months was hospitalized for treatment of atrial fibrillation.

2.3. Data Collection

2.3.1. Socio-Demographic Form

This consisted of six items regarding socio-demographic characteristics of the samples such as age, gender, education level, marital status, economic, and employment status.

2.3.2. Disease Characteristic Form

This consisted of four items regarding disease-demographic characteristics of the samples such as atrial fibrillation diagnosis time, CHA2DS2-VASC, HAS-BLED, and INR.

2.3.3. MMAS-8

In addition to the SEAMS, participants in the study were administered to Chinese version of the 8-item Morisky medication adherence scale (C-MMAS-8) measure of adherence [26]. C-MMAS-8 self-report measure is a reliable and valid index that has been used in various people. Cronbach's alpha for this scale is 0.77 [26].

2.4. SEAMS

The Self-Efficacy for Appropriate Medication Use Scale (SEAMS) contains 13 items. The response were encoded as "not confident = 1", "somewhat confident = 2" and "very confident = 3". The score for the 7-item scale ranged from 7 to 21. Higher scores indicated higher levels of self-efficacy for medication adherence.

2.5. Instrument Translation

This research includes the work of translating the SEAMS, which will be translated according to the method of back-translation indicated by Waltz, Strickland, and Lenz *et al.* [27]. The process is as follows: The work of instrument translation is divided into two steps. The first step of translation includes: 1) forward translation: translating from the original (source) language of the original instruments into a second (target) language. The original language of the original instruments which are referred to in this research is English, so the researcher decides to invite two bilingual experts for translating each instrument into the target language Taiwanese, and then there will be a primary Taiwanese version of each instrument; 2) discussion over Taiwanese version of each instrument: the researcher and the bilingual experts who assist in the work of translation have a discussion over the Taiwanese version of the instruments, and the discussion will focus on finding the expressions that convey the original meanings the most properly and assessing the extent to which the expressions

are comprehended in each instrument; 3) inspection from the objects of study: objects of study in different education levels are invited to inspect the extent to which the expressions in the instruments are comprehended, and the researcher will make revision; 4) reverse translation: another two bilingual experts are invited to translate the Taiwanese version of the instruments discussed previously into the original language, English, and then the researcher and the bilingual experts will discuss over the reverse translation of the Taiwanese version and the original instruments, comparing the extent of the difference between the meanings from both the original and the translated instruments; 5) pilot tests for each Taiwanese version of the instruments: the researcher will invite cardiologists, cardiac registered nurses, registered nurse experts, and patients with atrial fibrillation to have pilot tests for the Taiwanese version of each instrument, in order to test the extent to which the translated expressions in each instrument are comprehended and how much time the tests will take. The final version of the Taiwanese questionnaire was completed and made available for the reliability and validity study.

2.6. Procedures

Researchers distributed the demographic questionnaire, the SEAMS-T and C-MMAS-8 to patients. The questionnaire takes about 8 - 10 min to complete.

2.7. Evaluation of SEAMS

Internal consistency reliability: The Cronbach alpha coefficient was calculated to test the reliability of the questionnaire in its entirety.

Criterion-related validity: We analyzed criterion-related validity by comparing composite self-efficacy scores against the C-MMAS-8 using Spearman's rho. Researchers hypothesized that medication adherence self-efficacy and self-reported adherence would be positively correlated. And we would further establish criterion-related validity.

2.8. Ethical Approval

This study was approved by the Ethics of the "Taipei Medical University-Joint Institutional Review Board". The Ethical approval number is 201505054. The participants in the study were informed about the purpose of the study. All subjects were provided with written consent before participation. The researcher also guaranteed that the documents would be kept confidential.

2.9. Statistical Analysis

Descriptive statistics were used to describe socio-demographic and disease characteristics of the patients and their SEAMS-T scores. Percentages and frequencies were used for the categorical variables, while means and standard deviations were calculated for the continuous variables. Internal consistency was assessed using Cronbach's alpha. The significance level was set at p-value < 0.05. All analyses were performed using SPSS version 23.0.

3. Results

3.1. Sample

The final analysis included 151 patients with atrial fibrillation. The socio-demographic and disease characteristics of the total are shown in Table 1. The mean SD age was 71.98 ± 8.61 years; 62.9% were men. Of the 151 patients with atrial fibrillation, CH2DS2-VASc score was 4.03 ± 1.64, 3 (2.0%), 6 (4.0%) and 142 (94.0%) were in the low, medium and high risk; HAS-BLED score was 2.85 ± 1.11, 60 (39.7%) and 91 (60.3%) were in low and high score; INR was 1.67 ± 0.75.

Table 1. Socio and disease-demographic characteristics (n = 151).

socio and disease demographic	n	Percentages (%)	Mean	SD
Age			71.98	8.61
Gender				
Female	56	37.1		
Male	95	62.9		
Education Level				
No formal education	8	5.3		
Primary school	43	28.5		
Secondary school	21	13.9		
High school	33	21.9		
College or higher	46	30.4		
Marital status				
Unmarried	4	2.6		
Married	125	82.8		
Divorced/Widowed	22	14.6		
Economic status				
Not enough	16	10.6		
More enough	106	70.2		
Profit	29	19.2		
Employment status				
Full time/Part time	29	19.2		
Unemployed	4	2.6		
Retired	107	70.9		
Another	11	7.3		
Time of illness (month)			73.97	61.06
CH2DS2-VASc score			4.03	1.64
Low risk (score = 0)	3	2.0		
Medium risk (score = 1)	6	4.0		
High risk (score ≥ 2)	142	94.0		
HAS-BLED score			2.85	1.11
Low risk (score = 1 - 2)	60	39.7		
High risk (score ≥ 3)	91	60.3		
INR			1.67	0.75

3.2. Evaluation of SEAMS

3.2.1. Reliability

Cronbach's alpha test of internal consistency was 0.931 for the SEAMS-T, and its item to total correlation coefficient ranged from 0.584 to 0.781 (Table 2).

3.2.2. Criterion-Related Validity

SEAMS-T scale was moderately correlated with medication adherence as assessed by the C-MMAS-8 (Spearman's r = 0.450, p = 0.01), providing evidence for the criterion-related validity of the self-efficacy scale. According to correlation analysis, the level medication adherence was not associated with age (r = 0.053, p > 0.05), gender (t = −1.56, p > 0.05), education level (F = 0.50, p > 0.05), marital status (F = 0.81, p > 0.05), economic status (F = 0.52, p > 0.05), employment status (F = 0.42, p > 0.05), CH2DS2-VASc score (r = −0.12, p > 0.05), HAS-BLED score (r = −0.09, p > 0.05), and INR (r = 0.01, p > 0.05) in the total sample.

4. Discussion

The main objective of the study was to report the reliability and validity of the translated of SEAMS in a sample of patients with atrial fibrillation people. This study was the first one which translated and validated the 13-item SEAMS into the Taiwanese language. The original SEAMS was tested by Risser *et al.* [26] on coronary heart disease patients and other comorbid conditions patients, and it was found that the scale was reliable with good predictive validity and sensitivity. In our study the analysis indicated that SEAMS-T had good Cronbach alpha (0.931); however, the result is similar to those of study from Risser *et al.* (0.89). In addition, the Taiwanese version of the tool is valid, SEAMS-T was moderately correlated with medication adherence as assessed by the C-MMAS-8.

Table 2. Taiwanese version of the SEAMS reliability test.

	Mean	SD	Corrected item-total correlation	Cronbach's alpha if item deleted
Question 1	2.66	0.49	0.591	0.929
Question 2	2.50	0.64	0.584	0.929
Question 3	2.74	0.49	0.710	0.926
Question 4	2.61	0.58	0.740	0.924
Question 5	2.19	0.77	0.681	0.927
Question 6	2.70	0.53	0.673	0.927
Question 7	2.59	0.61	0.772	0.923
Question 8	2.52	0.60	0.739	0.924
Question 9	2.34	0.77	0.724	0.925
Question 10	2.47	0.69	0.781	0.922
Question 11	2.50	0.70	0.780	0.922
Question 12	2.41	0.71	0.658	0.927
Question 13	2.66	0.53	0.588	0.929

Cronbach's alpha was 0.931 for the total scale with significant intra-class correlation coefficient (p < 0.001).

Finally, regarding factors affecting the self-efficacy for medication adherence with atrial fibrillation patients, the analysis indicated that socioeconomic and disease characteristics of the sample were not associated with the self-efficacy of medication adherence. More specifically, no correlation was observed among the level self-efficacy of medication adherence and socioeconomic and disease characteristics. The study findings could be explained by the lack of significant variety regarding these characteristics in the sample.

Furthermore, the results are important for health professionals in the development and evaluation of strategies to promote atrial fibrillation patients' positive self-management. Strategies focusing upon self-efficacy enhancement could be provided to atrial fibrillation patients to improve their medication adherence.

5. Limitation

The main limitation of our results is that the study was conducted with atrial fibrillation patients making generalization to other diseases difficult. Future study can continue to examine the applicability of the SEAMS-T across other populations. Moreover, the present study was not conducted as responsiveness and predictive validity. Further research on these properties is encouraged.

6. Conclusions

For the first time in our study, the SEAMS is used and validated in the Taiwanese language. The Taiwanese version is proved to be acceptable to atrial fibrillation patients; it is a simple questionnaire that can be administered by a trained nurse in face-to-face interviews to overcome non-response by those who cannot read. The findings from this validation study indicate that the Taiwanese version of SEAMS is a reliable and valid measure because it shows acceptable reliability and validity.

The psychometric testing and validation of an instrument assessing the medication adherence of atrial fibrillation contribute to assessing the provided educational intervention. Nurses will have the opportunity to amplify their role in patients' education and develop a relationship based on honesty and respect.

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Conflicts of Interest

The authors declare that there are no conflicts of interest.

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Relationship of High Work Engagement among Staff Midwives with Their Immediate Superiors' Burnout on Maternity and Labor Wards in Japan

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Abstract

Introduction: Mental conditions for work among workers are related to clinical performance and influenced by colleagues within the same workplace. The aim of study was to examine the work engagement and burnout of staff midwives working on maternity and labor wards and to determine the factors related to high work engagement of staff midwives, including their immediate superiors' work engagement and burnout. **Methods:** A cross-sectional questionnaire survey was employed in Japan. Questionnaires were distributed to 452 midwives/nurses working on maternity and labor wards of 20 hospitals and responses from 96 staff midwives and 17 of their immediate superiors were analyzed. Work engagement and burnout (exhaustion, cynicism, and professional efficacy) were assessed by the Utrecht Work Engagement Scale and the Maslach Burnout Inventory-General Survey, respectively. To examine the association of work engagement among staff midwives with their ages, marital status and work engagement and burnout of their superiors, logistic regression analysis was conducted. **Results:** Immediate superiors showed significantly higher level of work engagement than staff midwives, while there was no difference in the burnout. High work engagement of staff midwives was significantly correlated with the professional efficacy (AOR 1.93, 95% CI 1.12 - 3.33) and cynicism (AOR 2.01, 95% CI, 1.04 - 3.90) of their immediate superiors. There was no correlation of work engagement between them. **Conclusions:** High work engagement of staff midwives was correlated to high professional efficacy and cynicism of their immediate superiors, suggesting that there might be crossover effects on mental conditions for work between staff midwives and their immediate superiors.

1. Introduction

Midwives working in maternity and labor wards have been shown to experience high levels of burnout and emotional stress [1] [2] [3] [4] [5]. Burnout from working has been used previously to assess workers' negative mental condition [6]. One of the most common scales for measuring burnout is the Maslach Burnout Inventory-General Survey (MBI-GS) in which burnout consists of exhaustion, cynicism, and professional efficacy [7].

In recent years, a positive mental condition for work has attracted attention, and Schaufeli developed the Utrecht Work Engagement Scale (UWES) which measures work engagement, that is, a positive psychological attitude to work [8]. He defined work engagement as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication and absorption. Schaufeli and Bakker [9] examined the conceptual framework of UWES with a job demands-resources model and the relationship between work engagement and burnout. The correlation between work engagement and burnout is mainly negative, but the authors did not refer to one underlying dimension. Professional efficacy as a subscale of burnout is also an element of work engagement, and work engagement and burnout do not negate each other but are independent [8] [9]. We thus need to examine the mental conditions for work among midwives working on the maternity and labor wards from both positive (work engagement) and negative (burnout) aspects.

Studies of work engagement for nurses are progressing and work engagement was reported to be related to employee performance and organizational management. In a review of work engagement among nurses, organizational factors versus individual contributors significantly impacted engagement at work [10]. Work engagement was also related to intention to remain among graduate nurses [11]. Additionally, in a meta-analysis for burnout, engagement, and safety at work [12], work engagement was positively related to safety climate for nurses [13]. From the viewpoint of patients, nurses' work engagement was significantly related to higher levels of patient satisfaction [14].

Work engagement and a professional nursing practice environment have a positive correlation [15], and it is necessary to analyze the correlation between them at a unit level [16] [17]. Within the same workplace, it has been noted that the burnout of staff and managers shows a crossover reaction [18], and team-level burnout and work engagement are related to individual team members' burnout and work engagement [19]. Supervisory relationships have the capacity to empower, inspire and motivate midwives [20], and a recent review in nursing concludes that supervisors' leadership and management influence work engagement of the staff [21]. However, it is unknown whether such a correlation exists

for work engagement and burnout between staff midwives and their immediate superiors working on maternity and labor wards.

2. Methods

2.1. The Aim

We aimed to examine the work engagement and burnout of staff midwives working on maternity and labor wards and to determine the factors related to work engagement of staff midwives, including their immediate superiors' work engagement and burnout.

2.2. Design and Setting of the Study

This study was conducted as a cross-sectional questionnaire among midwives and nurses working on maternity and labor wards of hospitals in Hyogo prefecture, Japan. Hyogo Prefecture is located in western Japan. It has both urban and rural areas. In 2012, there were 46,436 live births, 22.7 midwives per 10^5 population (25.0 in Japan) and 39.6 obstetricians per 10^5 population (40.7 in Japan). Therefore, we selected this prefecture as being representative of the working environment of midwives, and implemented a complete survey. We listed all hospitals in Hyogo prefecture that deal with insurance under the Japan Obstetrics Compensation System for Cerebral Palsy, and requested participation in the study from the nursing directors of a total of 51 hospitals by mail. Twenty hospitals (39.2%), including 7 maternal and child health (MCH) centers and 13 general hospitals, agreed to participate in the study.

2.3. Participants and Procedure

Data were collected in September and November 2012. Questionnaires were distributed to 452 midwives/nurses who worked on maternity and labor wards. Scales of work engagement and burnout were also provided. Of the 452 midwives/nurses in 20 hospitals, 253 (56.0%) including 170 staff midwives, 64 staff nurses and 19 head nurses/midwives returned responses by mail. The exclusion criteria of staff midwives were as follows: incomplete responses (n = 16), responses from part-timers (n = 13) and responses from midwives who did not work in maternity and labor wards (n = 5). To examine the correlation between staff midwives' work engagement and the mental condition of their superiors, we used responses from staff midwives whose superiors had also replied. Finally, we analyzed 96 staff midwives and 17 head nurses/midwives (immediate superiors) in 15 hospitals. There were two head nurses/midwives in the same wards of two hospitals, and their mean scores were used as a representative score of immediate superior in logistic regression analysis.

2.4. Measurement

The questionnaire consisted of demographic characteristics (age, years of experience, marriage, having a child, having an illness, working place, working hours,

number of days off per month, and turnover intention) and the following two scales.

Work engagement

Work engagement was assessed using the short form of the Utrecht Work Engagement Scale (UWES) [22]. The UWES includes three subscales that reflect the underlying dimensions of engagement: vigor (3 items), dedication (3 items), and absorption (3 items). All items are scored on a seven-point Likert scale ranging from 0 ("never") to 6 ("always"). Shimazu *et al.* [23] developed the Japanese version and confirmed the internal consistency with 0.92 of Cronbach's alpha and the three-factor structure with 0.90 of GFI, 0.86 of AGFI, and 0.92 of CFI.

Burnout

Burnout was assessed using the Maslach Burnout Inventory-General Survey (MBI-GS) [7]. The MBI-GS includes three subscales: exhaustion (5 items), cynicism (5 items), and professional efficacy (6 items). All items are scored on a seven-point Likert scale ranging from 0 ("never") to 6 ("always"). High scores on exhaustion and cynicism and a low score on professional efficacy are indicative of burnout. The Japanese version was developed by Kitaoka *et al.* [24] and the Cronbach's alpha coefficient was 0.85 in exhaustion, 0.81 in cynicism, and 0.87 in professional efficacy. It preserved a three-factor structure similar to the original version (GFI= 0.956, AGFI = 0.917, RMSEA = 0.086).

2.5. Ethical Consideration

The study was approved by the Ethical Committee of Health Sciences, Osaka University (No. 221). The anonymity of the participants was preserved.

2.6. Data Analysis

Characteristics of staff midwives and immediate superiors were compared. Age, years of experience, working hours, and number of days off per month were analyzed by t-test. The proportion of marital status, parental status, workplace, and turnover intension were analyzed by chi-squared test.

The scores of UWES and MBI-GS were compared between staff midwives and immediate superiors using an unpaired t-test.

To examine the association of work engagement among staff midwives with their ages, marital status and work engagement and burnout of their superiors, logistic regression analysis was conducted using 96 staff midwives whose superiors returned complete questionnaires. UWES scores were divided into five categories: very high (≥5.51), high (4.67 - 5.50), average (2.89 - 4.66), low (1.78 - 2.88), and very low (≤1.77) [25]. We then categorized very high and high as a high work engagement group (total score ≥ 4.67) and the others as a low work engagement group (total score ≤ 4.66). We used work engagement (low = 0, high = 1) as a dependent variable, and age, marital status (unmarried = 0, married = 1), superiors' total score of UWES, and each burnout score of exhaustion, cynicism, and professional efficacy as independent variables. Crude and adjusted odds

ratios with 95% confidence intervals were calculated.

The data were analyzed using SPSS version 21, and p < 0.05 was considered significant.

3. Results

The characteristics of participants are shown in Table 1. All participants were females. Immediate superiors were significantly older (p < 0.01) and more experienced (p < 0.01) than staff midwives. They had a child (p = 0.02) and an illness (p = 0.01) more frequently. They worked longer hours (p < 0.01) and took fewer days off (p < 0.01) than staff midwives, but there was no difference in turnover intention between them (p = 0.52).

Scores of work engagement and burnout were compared between staff midwives and immediate superiors (Table 2). In work engagement, immediate superiors showed significantly higher scores in total (p < 0.01) and in all three subscales than the others (p = 0.01 in vigor, p = 0.01 in dedication, p < 0.01 in absorption). However, there was no difference in the three subscales of burnout.

The data of logistic regression analysis of high work engagement among staff midwives are shown in Table 3. The adjusted odds ratio (AOR) for the immediate superiors' cynicism was 2.01 (95% CI, 1.04 - 3.90) and that for professional efficacy was 1.93 (95% CI, 1.12 - 3.33). There was no correlation of work engagement between staff midwives and their immediate superiors

4. Discussion

This is the first report concerning work engagement assessed by the UWES and burnout by MBI-GS among Japanese staff midwives on maternity and labor

Table 1. Characteristics of staff midwives and immediate superiors (head midwives/ nurses) on maternity and labor wards.

	Total	Staff midwives	Immediate superiors	p-value
N	113	96	17	
Age (years) (mean ± SD)	38.8 ± 8.7	37.4 ± 8.4	47.1 ± 4.4	<0.01
Experience (years) (mean ± SD)	14.1 ± 8.3	12.5 ± 7.8	23.0 ± 4.7	<0.01
Married (n, %)	71 (62.8)	58 (60.4)	13 (76.5)	0.28
Having a child (n, %)	62 (54.9)	48 (50.0)	14 (82.4)	0.02
Having an illness (n, %)	23(20.4)	15 (15.6)	8 (47.1)	0.01
Workplace (n, %)				
MCH center	39 (34.5)	32 (33.3)	7 (41.2)	0.59
General hospital	74 (65.5)	64 (66.7)	10 (58.8)	
Working hours (/w) (mean ± SD)	44.3 ± 8.5	43.0 ± 8.3	51.2 ± 6.5	<0.01
Days off (days/month) (mean ± SD)	9.2 ± 2.5	9.6 ± 2.2	7.5 ± 3.0	<0.01
Turnover Intention (n, %)	41 (36.3)	36 (37.5)	5(29.4)	0.52

Table 2. Work engagement and burnout of staff midwives and immediate superiors (head midwives/nurses) on maternity and labor wards.

	Total	Staff midwives	Immediate superiors	p-value
N (%)	113	96 (85.0%)	17 (15.0%)	
Work engagement				
Total score (mean ± SD)	3.12 ± 0.94	3.00 ± 0.89	3.82 ± 0.96	<0.01
Vigor (mean ± SD)	2.89 ± 1.11	2.77 ± 1.07	3.55 ± 1.13	0.01
Dedication (mean ± SD)	3.75 ± 1.06	3.65 ± 1.02	4.33 ± 1.10	0.01
Absorption (mean ± SD)	2.72 ± 1.03	2.57 ± 0.98	3.57 ± 0.90	<0.01
Burnout				
Exhaustion (mean ± SD)	3.06 ± 1.24	3.01 ± 1.21	3.31 ± 1.43	0.37
Cynicism (mean ± SD)	1.73 ± 1.13	1.69 ± 1.12	1.92 ± 1.24	0.46
PE (mean ± SD)	2.57 ± 1.17	2.52 ± 1.14	2.81 ± 1.29	0.35

PE: professional efficacy, unpaired t-test.

Table 3. Logistic regression analysis of high work engagement among staff midwives (n = 96).

	Low WE	High WE	Crude OR (95% CI)	Adjusted OR (95% CI)
N	71	25		
Age (years) (mean ± SD)	37.2 ± 8.8	37.9 ± 7.5	1.01 (0.96 - 1.07)	0.99 (0.92 - 1.07)
Married (n, %)	40 (56.3)	18 (72.0)	1.99 (0.74 - 5.37)	3.74 (0.99 - 14.12)
Immediate superiors' (head midwives/nurses)				
WE (mean ± SD)	3.80 ± 0.82	3.46 ± 1.04	0.65 (0.39 - 1.09)	0.67 (0.29 - 1.54)
Exhaustion (mean ± SD)	3.33 ± 1.28	4.14 ± 1.14	1.81 (1.15 - 2.84)*	1.61 (0.82 - 3.15)
Cynicism (mean ± SD)	1.76 ± 0.76	2.69 ± 1.58	2.15 (1.32 - 3.49)**	2.01 (1.04 - 3.90)*
PE (mean ± SD)	2.34 ± 1.24	2.48 ± 1.27	1.09 (0.75 - 1.58)	1.93 (1.12 - 3.33)*

Adjusted for all variables in this table. High WE (very high + high) = 1, WE: work engagement, OR: odds ratio, PE: professional efficacy, *$p < 0.05$, **$p < 0.01$.

wards, and the factors related to work engagement of staff midwives including work engagement and burnout of their immediate superiors.

In previous studies of work engagement assessed by UWES, Irish nurses/ midwives, who worked as a staff on wards in 58% and as nursing managers in 26%, scored 4.26 ± 0.49 [26], and German nursing unit managers who were involved in direct patient care for 30% scored 4.29 ± 1.01 in total score [27]. These mean scores were higher than the mean score (3.12 ± 0.94) in this study. An international comparison of work engagement among general workers revealed that the level of work engagement of Japanese was also lower than those in other countries [28]. The authors conclude that such differences might be caused partly by the cultural background of the Japanese, where people tend to be reticent about expressing their strong points. In the study, participants tended to understate the work engagement, and one need to be aware of this issue in inter-

preting the data.

It is well known that midwives have a high level of burnout compared with the general population [3] [4] [5], and are historically likely to be in a state of burnout [29]. Comparing the level of burnout among eight countries, Japanese staff nurses had higher levels of exhaustion and cynicism, and a lower level of professional efficacy than those in other countries [30]. Japanese nurses' burnout scores assessed by MBI-GS showed 4.05 ± 1.33 in exhaustion, 2.27 ± 1.34 in cynicism, and 2.46 ± 1.15 in professional efficacy [31]. Additionally, general Japanese scored 3.86 ± 1.50 in exhaustion, 2.32 ± 1.42 in cynicism, and 2.41 ± 1.14 in professional efficacy [6]. Comparing our data (3.06 ± 1.24 in exhaustion, 1.73 ± 1.13 in cynicism) with these results, midwives in this study may not exposed to higher level of burnout than other groups of Japanese workers.

Interestingly, staff midwives showed a significantly lower level of work engagement than immediate superiors (head midwives/nurses) (Table 2). In contrast, there was no difference in the mean scores of the three subcategories on burnout between staff midwives and immediate superiors. As shown in Table 2, the total score of work engagement was 3.00 ± 0.89 among staff midwives, whose scores were considerably low compared with those of nursing professionals in other countries and immediate superiors in Japan. Such a low level of work engagement might be problematic for management of staff midwives working on maternity and labor wards. García-Sierra *et al*. [21] highlighted the importance of managers' leadership at the ward level for promoting staff midwives' work engagement. In general, work engagement and burnout were reported to have a crossover effect. Team-level work engagement and burnout were related to individual team members' work engagement and burnout among Dutch constabulary officers [19], and there was a crossover effect of burnout between school teachers and their immediate principals [18]. We therefore examined the factors related to high work engagement of staff midwives, including work engagement and burnout of their immediate superiors. In the logistic analysis, work engagement of staff midwives was significantly correlated with the professional efficacy of the immediate superiors (AOR 1.93, 95% CI 1.12 - 3.33), while it was not correlated with work engagement of their immediate superiors (Table 3). These results suggested that there might be a crossover effect between work engagement of staff midwives and professional efficacy of their immediate superiors. Professional efficacy encompasses occupational accomplishments [9]. A lack of professional efficacy refers to a tendency to negatively evaluate one's work with recipients such as students, pupils, clients, patients, consumers or delinquents, and is accompanied by feelings of inadequacy toward one's work [32]. Work engagement of staff nurses was reported to comprise four influencing factors (impact of nurse managers, organizational antecedents, individual antecedents, and outcomes of engagement), among which individual antecedents included personal traits and family issues other than professional characteristics [21]. Although work engagement and professional efficacy express a positive attitude toward working, there was some difference in their significance. As a result, we

considered that co-working with immediate superiors who have high professional efficacy possibly increased the work engagement of staff midwives.

Moreover, cynicism of immediate superiors was correlated with high work engagement of staff midwives (AOR 2.01, 95% CI 1.04 - 3.90). Cynicism reflects indifference or a distant attitude towards working in general [8]. Autonomy is an antecedent of work engagement in nursing [33], and a lack of autonomy reduces work engagement [34]. Therefore, a distant attitude toward work of immediate superiors might induce autonomy toward work among staff midwives, resulting in elevated work engagement of staff midwives.

5. Limitations

There are some limitations to this study. Firstly, this study was a complete survey of Hyogo prefecture, which has an average number of midwives for Japan, and was the first examination of work engagement of midwives in Japan; therefore the sample size was not determined. In future studies, we should use larger numbers of hospitals selected by probability sampling and it will be necessary to determine the sample size based on the results of this study.

Secondly, we found a positive correlation between the work engagement of staff midwives and the professional efficacy and cynicism of their superiors, but a cause-and-effect relationship has not been determined yet. To increase the work engagement of staff, we need to reveal how to increase the professional efficacy of immediate superiors and also the staff midwives' autonomy.

Thirdly, this study demonstrated a correlation of mental conditions for work between staff midwives and immediate superiors, while a similar correlation might also be found among co-workers. In a future study, mental conditions for work should be comprehensively examined at the clinical unit level.

6. Conclusion

We found that staff midwives in Japan showed very low levels of work engagement compared with their immediate superiors and with nursing professionals in other countries, although there were no differences in burnout between them. High work engagement of staff midwives was correlated to high professional efficacy and cynicism of their immediate superiors, suggesting that there might be crossover effects on mental conditions for work between staff midwives and their immediate superiors working on maternity and labor wards in Japan.

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Educational Experiences of Undergraduate Male Nursing Students: A Focus Group Study

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Abstract

Background: The educational experiences of undergraduate male nursing students in developing countries such as Jordan have yet to be fully investigated in the literature. **Purpose:** The purpose of this study was to explore the educational experiences of Jordanian undergraduate male nursing students. **Methods:** A qualitative research design using inductive content analysis approach was used to explore educational experiences of undergraduate male nursing students at a prominent public university. Focus group interviews were used to obtain information of an interactive, conversational nature from male nursing students and to gain in-depth insight regarding their educational experiences. Twenty undergraduate male nursing participants representing the four academic levels of a nursing program were recruited. Four focus groups ranging between 4 - 6 students were used to gather data. Inductive content analysis was used. **Results:** Three themes emerged from this study: "nursing: a deliberate choice", "nursing is wonderful yet challenging", and "nursing is not for men". Students articulated that they deliberately chose to study nursing and to enter this academic field. Participants indicated that studying nursing was a wonderful experience that was intertwined with several challenges. Students from different levels explicitly emphasized that they were challenged and bombarded with enduring negative stereotypes and negative societal views regarding males in nursing. **Conclusions and Implications:** Findings illustrated that educational experiences of undergraduate male nursing students varied between wonderful experiences upon deliberate entry into nursing programs to enduring negative stereotypes and views regarding male nurses. Nursing educators are expected to comprehend the educational experiences of their students, particularly male students, and provide counseling, role-modeling and support as needed. Additionally, nurse educators should encourage all students to

*This study was done during sabbatical leave 2012/2013.

manage gender related problems by emphasizing a nurse's role identity without gender segregation or discrimination.

Keywords

Nursing Education, Academic Experiences, Nursing, Jordan, Male Student

1. Introduction

In nursing discipline, men are considered minorities facing many obstacles in their education and professional careers which include negative stereotypes, gender discrimination, and restricted employment [1] [2] [3]. In the past 30 years, literature focusing on the educational experiences of male nursing students has highlighted the influence of gender issues on nursing education and the development of a nursing identity [1] [4]. Moreover, most of the published studies have been conducted with different student populations within different programs (*i.e.* diploma, baccalaureate) in several industrial countries [5] [6] [7] [8]. Yet, there is still a need for more studies that focus on gaining a holistic understanding of the educational experiences from the perspectives of male nursing students in developing countries such as Jordan. Jordan is relatively a small country that has witnessed a shortage in nurses and a rapid increase in the number of male nurses in the nursing workforce. During the last two decades, interest in studying nursing has increased tremendously, especially among males. In 2007, there are thirteen nursing programs awarding a bachelor degree in nursing [9] [10] It becomes important to consider maintaining male nurses in the nursing field and promote a professional nursing image and enhance its standing in the community, especially for men. This study aimed to explore the educational experiences of Jordanian undergraduate male nursing students.

2. Methods

2.1. Design

A qualitative approach (Qualitative research is about exploring issues, understanding phenomena, and answering questions by analyzing and making sense of unstructured data) was used to describe the educational experiences of undergraduate male nursing students. Focus group interviews were used to obtain information of an interactive, conversational nature from male nursing students and to gain in-depth insight regarding their educational experiences [11] [12].

2.2. Sample Selection

Purposive sampling was used to select 20 Jordanian male nursing students from different academic levels (*i.e.* first year to fourth year) was employed in this study. Students were intentionally and purposively recruited to represent varied aspects of educational experiences of male nursing students enrolled in an undergraduate program in a prominent public university during their course of study. Addi-

tionally, students from different academic levels had significant contributions and feedback to offer about their recent experiences in nursing education, since they communicated significant ideas and represented their learning experiences very well. Participants were included in the study if they were male undergraduate nursing students, currently studying in one of the Jordanian nursing baccalaureate program in Jordan. Also, they were willing to participate in the study. Students who were recently enrolled in the nursing program were excluded because they lack the required experience.

2.3. Ethical Considerations

The study was approved by the scientific research ethics committee. Informed consent was obtained from all students and they had the option to withdraw from the study at any time and for any reason. To minimize bias, the moderators of the focus group discussions had no prior contact with or personal knowledge of the students at the time of data collection. The tapes and transcripts of the interviews were kept in a locked file accessible only to the investigators. Privacy was maintained to protect the identities of participants and confidentiality of the conveyed information was also assured.

2.4. Data Collection

The Procedure: After obtaining informed consent, participants completed a demographic data sheet. Four focus groups ranging between 4 - 6 students representing the four years of the undergraduate program were interviewed regarding their educational experiences [11]. The main interview question was "As a male nursing student, can you describe your nursing educational experience?" Focus group discussions were audiotape and participants in each focus group were given the appropriate time to express their ideas and talk freely regarding their personal experiences and views. The discussions were scheduled in agreement with the students and conducted in a designated quiet room at the faculty of nursing. Focus group discussions ranged between 30 - 70 minutes in length. To maintain rigor and credibility of the study findings, data analysis occurred independently by the researchers and themes were compared and discussed until consensus was achieved. Additionally two independent qualitative researchers determined the trustworthiness of the final themes through peer review [11] [12].

2.5. Data Analysis

All focus group interviews were transcribed verbatim, and phrases were obtained from the collected data which were reexamined to ensure consistency, then codes and themes were developed. In our study, inductive content analysis was used in data analysis. The process of data analysis entailed becoming familiarized with the data; open coding and creating categories after all written material were read more than once to comprehend all aspects of the content. Subsequently, categories were grouped based on similarities and three major themes

were generated.

3. Results

3.1. Subject Characteristics

General characteristics of participants are presented in Table 1. Participants were selected from different academic levels 20 male nursing students for their first (n = 5), second (n = 5), third (n = 5) and fourth (n = 5) years of study and aged 18 - 22 years.

3.2. Content Analysis

Content analysis revealed three major themes emerged from the data analysis included: Nursing: a deliberate choice; nursing is wonderful yet challenging; and nursing is not for men.

3.2.1. Nursing: A Deliberate Choice

Students articulated that they deliberately chose to study nursing and to enter this academic field. According to participants, the decision to study nursing was influenced by several factors including wanting to be a nurse to help people; having relatives that worked in health fields such as medicine; and having an interest in health-related specialties.

I love nursing and chose it willingly. By the way, it has nothing to do with grades. I like the hospital environment and patients. I like to help them and try to ease their sickness. For me, nursing is humanistic (1st yr focus group).

From the beginning, after finishing 10th grade I wanted nursing. I used to visit my uncle who was a doctor several times so I entered the health fields from the beginning. I saw the system in the hospital how patients rely mostly on nurses not doctors. Nurses' work 24 hours their job is great from this perspective (1st yr focus group).

Frankly, my mother and father are sick. I chose nursing to help them at home, so I entered into nursing (3rd yr focus group). It is nice to help people and have a positive role in life (4th yr focus group).

3.2.2. Nursing Is Wonderful yet Challenging

Participants indicated that studying nursing was a wonderful experience that

Table 1. General characteristics of participants (N = 20).

Characteristics	Categories	n	%
Age	18 - 20	7	35%
	21 - 22	13	65%
Gender	Male	20	100%
Religion	Moslem	19	95%
	Christian	1	5%
Marital status	Single	20	100%

was intertwined with several challenges. Students explained that they faced several difficulties and challenges during the course of their study that included acclimating to the new and unknown academic environment, dealing with demanding study workloads, and lack of time to manage different responsibilities. Participants proclaimed that although the gained knowledge was very interesting and appreciated, there was a consensus among students that studying nursing is not easy and entailed enduring the stress and strain of exams and clinical training.

For me, it was very fun and very difficult. The specialty was fun and wonderful from a work perspective. First of all, I didn't know what nursing was a wonderful experience although it had negative things. My experience was valuable and I gained knowledge and clinical skills (4th yr focus group).

When we first entered the program, we did not have any background about the courses at all. It needs studying through and through and follow-up on your studying. You have to be focused and write everything and follow the professor (1st yr focus group).

Nursing is a challenge... a new place... you come to a new environment and you do not know anybody. Now we have friends, we like to study and we get high grades (3rd yr focus group). The required material is too much you have to follow up on the lecture. We spend too much time understanding the material (2nd yr focus group).

3.2.3. Nursing Is Not for Men

Students from different levels explicitly emphasized that from the beginning of their educational experiences they were challenged and bombarded with enduring negative stereotypes and negative societal views regarding males in nursing. As students, they experienced rejection and mistrust and were confronted with popular views of nursing as a female profession. The negative stereotypes and views were experienced by participants throughout their course of study and were also voiced by other men in the form of male patients, male doctors, and male colleagues.

When someone asks me what am I studying and I say nursing they ask why? What are you going to do with it? Couldn't you find anything else? (1st yr focus group).

Society has an inferior view of nursing. Although there are a lot of jobs in nursing in nursing colleges there are not a lot of male students. In one course, we had 75 female students and only 2 male students (2nd yr focus group). Nursing is for girls... I heard this statement a lot (3rd yr focus group).

"One time I was in the hospital during the adult health rotation and I was assigned a male patient with a case of falling down. When I came in the room he asked me if I was a doctor, I said no I am a nursing students; so he said to the staff I don't want male nursing students to work with me (4th yr focus group).

4. Discussion

The purpose of our study was to gain an overall understanding of the education-

al experiences of male nursing students in an undergraduate nursing program in Jordan. Studying nursing, as any experience, entails both positive and negative aspects that influence individual perceptions. In general, nursing students fall under one of two groups: those who purposefully choose nursing and those who enter into nursing due to lack of other alternatives. Hence, choosing to study nursing and enter into professional practice are not easy decisions.

Our findings supported evidence in international literature which depicts male nursing students deliberately choosing to study nursing. Jordanian male nursing students, similar to other male nursing students in the world, reported that were happy to enter into a specialty that they liked and to begin the career of their choice. Students also viewed nursing as a caring, humanistic profession which leads to helping others and providing valuable services to society [3] [13] [14]. However, some students reported that although they entered nursing willingly, they did not make this choice based on a full understanding of nursing education. Students implied the absence of orientation programs that help recruit future nursing students that may help them in making "informed decisions" regarding their education.

In this study, participants perceived nursing as wonderful experience that was intertwined with several challenges. According to students, studying nursing is a mix of both positive and negative events. Students valued the importance of knowledge, skills and personal growth gained from different nursing courses, yet they were astounded by the burden of adapting to a new environment, time management, the intensity of exams and clinical rotations. This finding was particularly true for freshmen and sophomores who were still in the process of learning the nature of nursing and adapting to entry level courses and clinical experiences [15] [16] [17].

Our study furthermore reiterated common ideas of nursing as a female-dominant profession with limited space for masculinity. Males still struggle with being accepted into nursing programs and the nursing workforce, despite the improved status of male nurses in the world [16] [18] [19]. Male nursing students emphasized several sentiments regarding negative views and stereotypes that they encountered throughout the different academic levels [8] [20] [21] [22]. From freshmen to seniors, students faced rejection and mistrust from others, solely based on their gender. Gender identity, gender roles, and gender discrimination in nursing remain salient and debatable issues that require reevaluation and review [23] [24] [25].

5. Limitations

Small sample number could be considered as limitation for this study .However the participants were selected as purposeful sample considering the maximum variation of the participants (years of study, age, and gender). Also, all the interviews were conducted by a female researcher which may influence the participants sharing their full experience.

6. Conclusion and Recommendation

The study findings demonstrated three major themes emerged from the data

analysis including: students deliberately chose to study nursing, perceived nursing as wonderful experience that was intertwined with several challenges, and thought that nursing is not for men. However, the study findings indicated that male nursing students emphasized several sentiments regarding negative views and stereotypes that they encountered throughout the different academic levels. The results of this study may help in providing evidence-based criteria for the gender-role perceptions of male nursing students for their retention in the nursing profession. It is recommended to use the results of this study in educational settings whenever male nursing students are. This may help the educators to have deeper understanding of the experience of male students which may reflect positively in improving students' clinical practice.

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Family Care Centre Model Could Decrease Anxiety Level among Family Members of Patients Who Have Been Undergoing in the Intensive Care Unit (ICU)

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Abstract

Critical illness/critical condition from any diseases and life-threatening event are the trigger factors of anxiety among family members of patients who are being cared in the intensive care unit. The anxiety is felt by patient's family members who undergoes in ICU. It is generally triggered by uncertain patient's conditions, room conditions, strict visiting time and cost factors. Unfortunately some nurses often fail to give attention to the family in such phenomenon and more focus to the physical patient condition. In that regard, giving attention to the family members of patients who are undergoing hospitalization in the ICU is very important and should be done by nurses by applying the Family Care Center (FCC) model. This study aims to determine the effect of the application of the model of family care center to decrease the anxiety level of family members. The results will be very useful to improve the quality of nursing care, especially in applying the model of the FCC as efforts to redeem any anxiety issues among family members. The method was used to quasi-experimental design with pre and post-test by using the control group. The total of 48 family members of patients who are undergoing hospitalization in the intensive care unit in Dr. Hasan Sadikin Hospital is willing to be used as samples in this study. It was obtained by purposive sampling technique. Data were collected by the Hamilton Anxiety Rating Scale (HARS) and analyzed by univariate analysis using mean and standard deviation, then in the bivariate analysis using paired t-test test and Independent t-test. The results showed that there was significant application of the FCC to decrease family member's anxiety level in ICU. The conclusion of this study is: FCC can be implemented to reduce anxiety level of family members of patients who are undergoing in the intensive care unit. According to the results, this study suggested to the nurses who are working in the intensive care unit to apply FCC model in re-

ducing anxiety level of families members so that they can use the constructive mechanisms to decrease their anxiety.

Keywords

1. Introduction

1.1. Background

The families of critical condition patient commonly have experienced in high level of anxiety, especially losing their beloved one. Due to such phenomenon, families typically experience fear associated with loss of control, uncertainty, and financial constraints. The accumulation of many stressful factors may lead to crisis condition that can threaten family integrity and lose their ability to cope with their problem [1] [2] [3].

It is necessary to concern about the family of critical ill patients. It is a general consensus that involving families in the patient care is important and has positive effect on both families and patients. In this context, family members can have a great impact on the patients' general well-being by providing psychological and emotional stability [4] [5] [6]. Therefore, the family members are the important people who should be involved in decision making and therapeutic process from the state of being well to diagnosis, treatment, and recuperation [7].

Unfortunately, in the acute and critical care settings, nurses are highly focusing on the physiological and psychological impacts to the life-threatening illness of the patients. Limited attention and care have been given to family members. As a consequence, nurses do not provide appropriate nursing intervention to the family, especially to solve their high level of anxiety [8] [9].

To alleviate the anxiety level of family and to help their families, they should be able to cope with this condition, and involving the family into nursing care process is vital. One theory that can be used to solve such problems is applying the Family care centre [10] [11].

In this study, nurses and family members collaborate as a partnership to solve the anxiety problem. Commonly, this model is used in the pediatric care unit, but in the intensive care unit, FCC also can be used because the patient in the critical ill condition can't make decision by theirselves or they mostly depend on the families. Therefore, the patients independency level would directly affect their family.

The study aims: "to analyze the responsiveness effect of the FCC model in decreasing anxiety level of family members of patients who have been hospitalized in the intensive care unit. Result of this study can be used to promote the positive roles of family members in the critical care setting in order to assist them to redeem their anxiety level.

1.2. Conceptual Framework of the Study

Apply Family care Centre (FCC) Model	→	Anxiety level of Family members who are undergoing in the ICU.
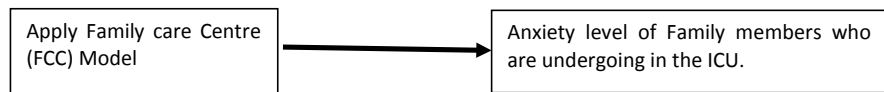
1.3. Definition of Term

Family care centre is an effort of counseling and mentoring done by researchers with the involvement of the family members who has been undergone hospitalization in ICU for facing the problem of their anxiety level, from assessing, planning, implementing FCC model and evaluating it within 3 days.

Anxiety levels of family members of patients who undergo hospitalization in the intensive care unit are signs and symptoms of both physical and psychological aspects that before and after the model is implemented by family care centre. It can be measured by Hamilton Anxiety Rating Scale, including: feelings of anxiety, tension, fear, sleeplessness, intellectual, somatic muscles, somatic sensory, signs of cardiovascular system, respiratory, digestive, urinary, autonomic, and changing behavior during the interview. The value range from 0 to 56, it means the higher the value, the bigger the anxiety level [12].

2. Research Methodology

This study used a quasi experiment of pre and post test design with control group. It has been implemented since July to September 2015, offspring about 48 family members who were undergone in the ICU Dr. Hasan sadikin General Hospital Bandung, 24 family members were in the intervention group and the rest were the control group. The intervention group was the family members from general ICU (GICU), meanwhile control group was the family members from neurosugery ICU (NCCU). The data was obtained by using purposive sampling technique.

The family members who were selected based on inclusion criteria were responsible for and take care of; the patients every day, new admission in the ICU, and some them didn't have experienced yet to take care of the patient in the ICU, cooperative, able to listen and speak clearly and sincerely to be a respondent. Meanwhile exclusion criteria were the family members who didn't take care the patient every day, on the mild level of anxiety, and illiterate.

This study has ethical approved by ethical comission of Bandung Health Polytechnic, with the number: 60/KEPK-PKKB/6/2015 on the date June, 4, 2015 that signed by drg. RR. Megananda Hiranya Putri, M.Kes., as a head of ethical comission, and also has got permission by Director of HRD and education affair of Dr. Hasan Sadikin Bandung hospital, on the date July, 15, 2015.

Data collection was begun by identifying family members who meet inclusive criterion, then they were provided an informed consent and asked approval that was being the respondents. Subsequently measured that the respondent from intervention group and control group level of anxiety (pre-test), and then applied family care centre model within 3 days, based on thethree steps. In the first step,

it focused to assess the cause of anxiety family members within 30 minutes, and then they were asked to provide nursing care plan including FCC model to solve the problem. The second step was implemented FCC model within 3 days by using education and consultation program, and empowering the family members accordingly to the cause of anxiety and to reduce anxiety level as well. This step was provided in 1 - 2 hours before visiting time, in order to prepare the family members can involve into nursing care when they met the patient in the visiting time. Third step was evaluating the implementation FCC model in the second step approximately in 30 minutes. After the family members completed the whole series of treatments then they directly measured the level of anxiety as a data post-test. Data processing was done by step: editing, coding, entrying, cleaning and processing, data.

3. Result

3.1. Univariate Analysis

Respondent characteristic of this study was focusing on age, education level, job, and previous experienced of taking care the patientin ICU of the family members and also relationship of the family to the patient. According to Table 1, half

Table 1. Respondent characteristic.

No.	Respondent characteristic	Intervention group		Control group	
		f	%	f	%
1.	Age: • 17 - 40 years old (early adulthood) • 41 - 60 years old (late adulthood)) • More than 60 years old (elderly)	9 12 3	37.50% 50.00% 12.50%	10 12 2	41.66% 50.00% 8.34%
	Amount	24	100%	24	100%
2.	Education level: • Low (elementary and yunior high scool) • Midle (senior high school) • High (University)	12 6 6	50.00% 25.00% 25.00%	15 7 2	62.50% 29.17% 8.33%
	Amount	24	100%	24	100%
3.	Job: • Worked • Not Worked	10 14	41.66% 58.34%	9 15	37.50% 62.50%
	Amount	24	100%	24	100 %
4.	Experienced care the patient in ICU: • First experienced • Two experienced • ≥3 times experienced	10 8 6	41.66% 33.33% 25.00%	9 8 7	37.50% 33.33% 29.17%
	Amount	24	100%	24	100%
5.	Relationship with the patient: • Spouse • Children • Parent • Brother or sister	10 4 6 4	41.66% 16.67% 25.00% 16.67%		29.17% 16.67% 41.66% 12.50%
	Amount	24	100%	24	100%

of the family (50%) in the intervention and control group is in the late adulthood, most of them have low education level and jobless, and less likely about 41.7% of them didn't have experience to take care of the patient in ICU as a spouse or as a parent (refer to Table 1).

Table 2 showed the meanscore ofanxiety level of the family members in the intervention group before applied FCC model is 49.45 with standard deviation 4.43 and then after applied FCC model their anxiety level decreased to 18.79 with standard deviation is 3.84. Meanwhile in the control group their anxiety level in the pre test is 47.79 with standard deviation is 6.22 and decrease into 20.29 with standard deviation 4.12.

3.2. Bivariate Analysis

According to Table 3 that shown difference mean in the intervention group is 29.08 (Sd = 5.20), meanwhile the difference mean in the control group is 27.50 (Sd = 5.27). There are significant effect on the intervention and control group to decrease anxiety level of the family members who undergo in the ICU (p = 0.000).

To analyze effectivity of the implementation FCC model to decrease anxiety level on the family members who undergo in intensive care unit was used independent t-test, the result as shown in Table 4. Based on Table 4, Levene's test

Table 2. The anxiety level in the intervention and control group before and after applying FCC.

Anxiety level	Intervention group				Control grup			
	Pre		Post		Pre		Post	
	$\bar{x}$	Sd	$\bar{x}$	Sd	$\bar{x}$	Sd	$\bar{x}$	Sd
Score of anxiety level	49.45	4.43	18.79	3.84	47.79	6.22	20.29	4.12

$\bar{x}$ = means, Sd = Standard deviation.

Table 3. Effect of applied FCC to decrease anxiety level both of intervention and control group.

Group	N	Difference mean	Standar deviation	t	p-value
Intervention group	24	29.08	5.20	31.86	0.000
Control group	24	27.50	5.27	25.54	0.000

Table 4. Effectivity of the implementation FCC model to decrease anxiety level family members who undergo in ICU.

Levene's test for equality of variances	t-test for equality of means		
Sig.	Mean difference	Standard error difference	Sig (2-tailed)
0.737	1.50	1.15	0.009

show there are not significant difference mean between control group and intervention (p = 0.737), it means that there are no difference varians between control and intervention group or both group are homogen. Then, based on independent t-test that can be found the result, there are significant difference mean about 1.50 (Sd = 1.15, p = 0.0009). It means the implementation FCC model can decrease effectively anxiety level of family members who undergo in ICU.

4. Discussion

Stuart and Sandeen (1998) cited in Hawari (2008) defined that anxiety is an abnormal and overwhelming sense of apprehension and fear often marked by physiological signs (as sweating, tension, and increased pulse), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with it [13]. In this study the precipitating anxiety factors are patients who has been undergone to the ICU. Commonly patient who has be admitted to the ICU are in unstable condition. It was due to using any medical devices, and in life threatening event, so, it may cause negative effect to their family members, especially to get high level of anxiety.

Result of this study found that mean score of level anxiety in the intervention group before applied FCC model (pre test) is 49.45 (Sd = 4.43) and mean score after applied FCC model (post test) was 18.79 (Sd = 3.84). Meanwhile, the mean result of pre test was 47.79 (Sd = 6.22) or it was the highest level of anxiety, and the mean score of post test was 20.29 (Sd = 4.12). This result showed that the family members who were in the intervention and control group in the pre test for both of them was in the same lavel of anxiety, that was in the severe or high level. The result of post test anxiety level was the same level too, both of them was in the middle level of anxiety.

The result of this study is like as/similar to the previous study from Zahara Farhan (2014) about stress predictor of family members who undergo in ICU that found 95% family members reached the highest stress level when one of their family members have to be undergone in ICU [14].

The result of this study is related to respondent's characteristic, such as: education level, occupation, and relationship with the patient. According to Table 1 we can see that the majority of respondents have low education level. According to Notoatmojo (2005) cited in Desmita (2008), education is one of the factors that determine a person ability to access information. The higher the level of education, the easier the people of incurring information. Based on in this study, the majority of of respondents have low education level that has led to the lack of ability of these families to access information, especially information related to patient in ICU, which ultimately lead to severe anxiety [15].

The highest meanscore of anxiety in this study because most respondents were not in paid (58.3% in the intervention group and 62.5% in the control group). This condition triggers the anxiety level. They do not have any satisfied source of income to covertheICUtreatment charges which is tooexpensive. Although there is BPJS program, they yet look for necessities as family nonetheless anxious be-

cause they have accommodation during period of accompanying waiting patient at the hospital.

The closeness relationship among patients' relatives gives a negative impact on the level of the anxiety of the family members. In the intervention group, mostly family members were caring his or her spouse (41.7%), while the control group was responsible to his parents. Closely his emotional connection/psychological with the patient against his spouse or parent is certainly preveil in a great pressure on anxiety levelcompared to these felt who have less emotional connection that is less a like. It was predominantly consideration, lovely feeling together with unreadiness yet to be left by his/her spouse.

Friedman (1998) stated that their family problems will affect other family members, in this study their family members who are sick and hospitalized in the intensive care is a source of stress for other family members to get trigger the anxiety level. If the anxiety is not addressed then the family will fall in a state of panic and can lead to destructive behavior [7].

In that regard, it is one of the efforts to be made by nurses to reduce the impact of anxiety in the family is to involve the family in caring the patient through the implementation of a model of family care center (FCC) [16].

Effect of apllying FCC model to reduce the anxiety level of family members who undergo in ICU.

FCC model is a method that emphasizes the belief among health workers and family members in dealing with the problems faced by the patient and his relatives, started from planning, implementing and evaluating the care plan. In applying the model, there are 4 basic principles that should be considered, 1) their honesty and mutual respect among nurses, patient and his/her families, 2) there should be a sharing of information amongpatient, families and health workers; especially nurses, 3) the family involvement in caring the patient and 4) the collaboration among health workers in providing services to patient and family members [16].

The result of this study shown in **Table 3** indicated that the paired t-test analysis of both the intervention and the controlled group were statistically significant effect (p-value = 0.000) respectively. Furthermore, based on analysis using the independent t-test formula, shown in **Table 4** was obtained p-value = 0.009, which means there are very significant result by applying the FCC model to decrease families members' anxiety leevel whoundergo in ICU.

Hence, it indicates that the application of FCC model conducted by researchers by involving patient's family member which in the implementation of nursing care, especially in dealing with anxiety issues starting from the stage of identification of the source of anxiety, planning in dealing with anxiety problems, then carried out efforts to overcome the problem by nurses to provide education and counseling to family members during visiting time that could prove successful in reducing the anxiety level of the patient's family members. They seem to be more calm and able to control their emotion when visiting their patient.

The key succeed on implementing the FCC model in this study is influenced

by the characteristics of respondents themselves as the intervention groups, based on the age of ranging from 41 - 60 years old was about 50% elderly. Generally they are mature, easy to give understanding, responses cooperative, and they have a sense of responsibility to think realistically [15].

In addition, experience is considered as another factor that affect outcome of this study; more than half (58.3%) of respondents in the intervention group has already been experienced for more than 1 time caring aspatients in ICU, so they have already enough knowledges and experiences, able to control and to control their emotions easily, as a result that they can be more quickly to adapt the situation.

These results are similar to theresearch paper done by Puspita (2010), which showed a significant relationship between family support and the patient's anxiety levels who has been being treated in ICU. It gave a positive effecttothe patient of decreasing anxiety with stand contrast to the family whom experiences were not theirs to decrease anxiety level (p = 0.001) .

Moreover, other researchers showed positive effect on family involvement at the time of implementing the nursing care. FCC was also considered as the most basic method to care of the patient, respect, collaboration and support them. Family involvement in caring of patients through applying FCC method was the strongest predictor in improvingthe feeling of respect, collaboration and support (OR = 1.66 and p-value = 0.001) [16].

Positive effects on applying of FCC model towards elderly patient's were also by obtained the research paper done by Anndale Mc Tavish and Cynthia Phillips (2014), it was about the experience of patient whom they weretreated by the application of FCC model in Kingston General Hospital, the results showed that the patientwho was treated in the hospital felt the quality of care and quality of life had been increased [17].

Through application of the model FCC is the family seemed patient calm and ready emotionally when they came to visit patient on visiting time, this can be seen from the behavior of those who are no longer crying when dealing with the patients. Family members seemed unwilling to open communication with patient, support, and do some simple actions that do not endanger the patient. Therefore, with the involvement of the patient's family members seemed quietly that the patient condition can be easily seen by the description of vital signs. It shows that between patient dan family has inner relationship closely, where the adaptive response of the family in the form of constructive coping directly to assist them during the recovery of physical patients condition and this can reduce the length of stay the patient.

5. Conclusions

1) Anxiety level in the intervention group before applying the FCC model is 49.46 or at the level of severe anxiety while after the application of the FCC model, the value decreases to 18.79 or in the middle level of anxiety.

2) Anxiety level in the control group in the pre-test is 47.79 or at the level of

severe anxiety while the result of the post-test is 20.29 or in the middle level of anxiety.

3) Application of FCC is proven to significantly reduce anxiety level of family members of patients who undergo in the ICU in the intervention group compared with the control group (p = 0.009).

6. Suggestion

1) Related to this results and the previous study, the model FCC should be considered to be applied when caring patients in the ICU because patient who were undergo in the ICU, in general to those who some condition of dependence on others, unable to make decisions themselves and feeling depressed, so that the presence and involvement of the family members to be highly significant and important to be perceived by patient. In applying this model should also be noted patient condition and mental readiness of families to be involved in nursing care of the patient in order not to interfere with the work of nurses and other health team.

2) It is necessary to conduct further research related to the application with the FCC model of different methods e.g. by qualitative research to further explore the patient's experience, families and caregivers about the effectiveness of model FCC. This research could also be more meaningful to further examine the characteristics of respondents to the success of FCC or can be developed by examining the different variables of the FCC's influence.

Acknowledgements

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How Can Manual Rotation Reduce Vacuum, Forceps and Caesarean Deliveries? —A Review of the Evidence

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Abstract

The aim of this review was to investigate whether manual rotation can be used to reduce vacuum, forceps and caesarean deliveries in women with occiput posterior or occiput transverse positions from 7 cm dilation in labour. A search strategy was developed and relevant papers published between 1946 and January 2015 were identified from electronic databases. Key search terms used were manual and digital rotation, labour presentation, obstetric labour complications, occiput posterior and version foetal. The search revealed 330 papers. A short list of 33 publications of possible relevance was compiled and assessed using the following criteria: primary studies on the effectiveness of manual rotation performed in women with singleton occiput posterior or occiput transverse presentations published in English or the Scandinavian languages. The quality of the included studies was evaluated by means of the critical appraisal tools for quantitative studies. Seven studies were included in the thematic analysis. The results varied but the main finding was that in order to decrease vacuum, forceps and caesarean deliveries by means of manual rotation, it is essential that the procedure is successful. The success rate of manual rotation is dependent on the experience of the healthcare professionals who perform the rotation procedure rather than the technique employed. Predictors of successful manual rotation were used after engagement of the foetal head, at full dilatation and prophylactic use before failure to progress in labour. In conclusion, although the results vary, there is a consensus in all the studies that manual rotation is worth considering and that it can contribute to decreasing vacuum, forceps and caesarean deliveries. The implications for practice are that successful manual rotation can reduce caesarean delivery and increase spontaneous vaginal delivery, but experience is necessary to perform successful rotations. Because there are no risk factors associated with manual

or digital rotation when performed after engagement of the head and at full dilatation, they are worth considering. The central role of the midwife in each individual labour makes her important for ensuring that manual rotation can be considered at the right time in labour.

Keywords

Literature Review, Midwifery, Manual and Digital Rotation, Labour Presentation, Occiput Posterior

1. Introduction

Occiput posterior (OP) and Occiput transverse (OT) positions have been associated with difficult labours for centuries [1]. For this reason, Dr William Smellie conducted and reported the first instrumental rotation from an OP to an Occiput Anterior (OA) in 1745 [2]. The benefits of rotating the foetus have been debated ever since, although it is well known that OP presentations represent a great risk [1] [3] [4] [5].

The instrumental rotation forceps and instrumental delivery in general have been associated with many serious complications such as the 3rd and 4th degree lacerations, postpartum haemorrhage and neonatal morbidity, despite the fact that with appropriate training, the techniques can be performed safely [6] [7]. Manual rotation (MR) is a procedure where the whole hand is used to manually flex and rotate the foetus from an OP or OT to an OA presentation [8]. Digital rotation (DR) is when only the fingers are used to perform the rotation [9]. However, MR is the general term and will be used throughout the paper.

The MR technique was first documented in 1888 [10]. The procedure is employed as a technique to ensure that the head of the foetus is in a good position for application of the forceps [11]. For that reason, MR may have been associated with the risks involved in instrumental manoeuvers. However, it is a safe, effective and low cost procedure that increases the chance of vaginal delivery [12] [13] [14].

It has been reported that the incidence of OP and OT positions in the first stage of labour is 33.9% and 27.7% respectively [15]. In the second stage, 19% of foetuses are still in an OP position and 16.7% in an OT position [15]. Although most foetuses in an OP position rotate spontaneously, 5.5 to 8.3% have been reported to remain in persistent occiput posterior (POP) position [5] [16]. Of these, 68% require a vacuum delivery (VD), Forceps delivery (FD) or Caesarean delivery (CD) [3]. The CD rate in Norway and worldwide has risen over the last three decades [17]. In 2013 every sixth child born in Norway was delivered by CD, which is about 10,000 children a year [18].

There is a significantly increased risk of maternal morbidity associated with CD compared with spontaneous vaginal delivery. Complications occur in 21% of all CD patients [18], the most common of which are postpartum bleeding and

infections. Other complications are trauma to the bladder and intestines. A woman who underwent a CD has a 45% increased risk of another CD in subsequent labours [18]. Perhaps the greatest problem with undergoing a CD is the complication that can cause in subsequent pregnancies and labours such as miscarriages, bleeding during pregnancy, prolonged labour, premature labour and low birth weight. Serious complications reported include uterus rupture, ectopic pregnancy [18], placenta praevia, placenta accrete [19] and intrauterine death [20].

There are several reasons for a CD, making it necessary to consider different approaches for reducing the CD rate. Prolonged labour is the reason for 20.7% of all emergency CDs in Norway [18]. The reason for prolonged labour is diverse and complex, but mal presentation of the head of the foetus has been recognised as a great risk for dystocia. Of all emergency CDs, 18% are because of dystocia related to OP presentation [21].

Research has been conducted on how to prevent dystocia and facilitate vaginal delivery, involving active management of labour [22] and one-to-one care in labour [23]. Although the results have not shown a significant reduction of the CD rate, many birth wards base their procedures for ensuring progress in labour on active management of labour research. However, these studies do not take the rotation and presentation of the foetal head into account.

2. Aim

The aim of this study was to investigate whether MR can be used from 7 cm dilation in labour to reduce VD, FD and CD in women with OP or OT positions.

3. Methods

3.1. Inclusion Criteria for This Review

Studies were selected for inclusion based on the population, intervention, comparison, outcome measures and study design.

Population: Women in labour with a singleton, non-anomalous, live birth. Three of the included studies described rotation of OP positions, while four described rotation of both OP and OT positions.

Intervention: Manual rotation after 7 cm dilatation.

Comparison: Four of the included studies compared MR with expectant management and three compared successful MR with unsuccessful MR.

Outcome measures: Vacuum, forceps or caesarean delivery.

Study design: Primary studies.

Exclusion criteria were MR or DR used on other cephalic presentations and unpublished literature.

3.2. Search Methods for Identification of Studies

The systematic search was conducted in the Medline, Ovid Medline, SveMed+, Cinahl, Cochrane Library, Maternity and infant care and Up To Date databases

for the period 1946 to January 2015 with guidance from a specialist librarian employed at the Medical Library of Oslo University hospital, Ullevål. The following keywords were employed: manual rotation and digital rotation, labour presentation, obstetric labour complications, occiput posterior and version foetal. The search and findings were reported according to the method described by Aveyard [24]. An example of the search in one of the main databases, Ovid Medline is presented in Table 1.

A total of 330 papers were retrieved from the database search, of which seven were included in the thematic analysis (Figure 1).

3.3. Data Collection and Analysis

3.3.1. Study Selection, Data Extraction and Management
A list of articles that met the inclusion criteria based on abstracts was compiled. The full texts of these studies and those of possible relevance were retrieved and evaluated in accordance with the inclusion criteria.

The following data were extracted from all selected studies: general information (authors, publication year and country of investigation), aim, design and number of patients. A summary of the included articles is presented in Table 2.

3.3.2. Quality Assessment
The seven articles were evaluated using tools from the Critical Appraisal Skills programme (CASP) [25] (Table 3). They included one case control study, two cohort studies and one pilot study. The remaining three were a mix of retrospective and prospective studies with no other definition. The pilot study and the

Table 1. An example of the search in Ovid Medline.

| Searches	Results
1. Version, Foetal/	666
2. exp Labor Presentation/	6105
3. exp Obstetric Labor Complications/pc [Prevention & Control]	7471
4. occipit*.ti,ab.	32,247
5. occiput*.ti,ab.	1448
6. ((tranverse or posterior*) adj2 posit*).ti,ab.	1652
7. ((tranverse or posterior*) adj2 delivery).ti,ab.	50
8. ((tranverse or posterior*) adj2 deliveries).ti,ab.	9
9. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8	48,043
10. Rotation/	21,642
11. ((manual* or digital*) adj4 rotat*).ti,ab.	492
12. 10 or 11	22,045
13. 9 and 12	282
14. limit 13 to (Danish or English or Norwegian or Swedish)	256
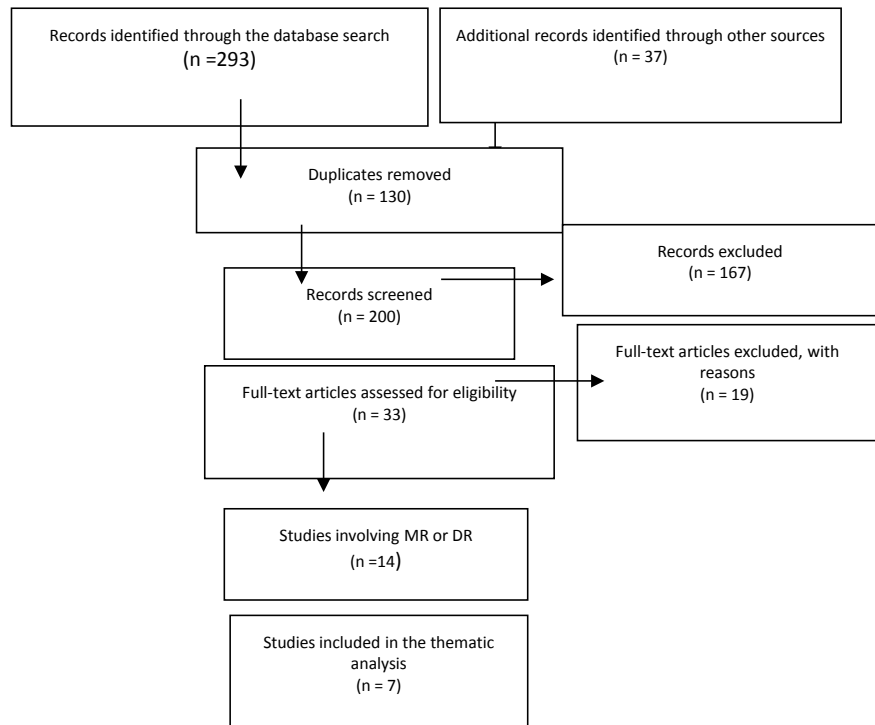
Figure 1. Flowchart of selection of studies for the review.

Table 2. Study characteristics of the included studies quality assessment.

Main author (year) country	Aim of study	Type of study	Population
Shaffer (2006) USA	To define predictors of successful rotation and rate of caesarean delivery after manual rotation of the foetal occiput from occiput posterior or transverse position	Retrospective cohort study	742 women met the criteria during the study period
Reichman (2008) Israel	To study the efficacy of DR in reducing the prevalence of POP positions and its consequences	Prospective study	Group 1: without intervention, 30 women Group 2: DR or MR, 31 women
Shaffer (2011)USA	To examine mode of delivery and perinatal outcomes in women with OP or OT position in the second stage of labour with a trial of MR compared to expectant management	Retrospective cohort study	Group1: MR 731 women Group2: Expectant management: 2527 POP or OT positions diagnosed at delivery
Le Ray (2013) France	To assess the effect of a policy of MR on the mode of delivery of foetuses in OP or OT positions at full dilatation	Prospective study	Hospital 1: No MR 111 women Hospital 2: MR 220 women
Sen (2013) Japan	To examine the risk factors and management processes of the POP position by analyzing medical records from one hospital.	Retrospective study	OP positions in labour: 103 MR: 17 Posture change: 13 The rest: no management Control group: 1054 OA positions
Graham (2014) Aus-tralia	To determine the feasibility of a multicentre RCT to investigate whether DR of the foetal head from OP position in the second stage of labour reduces the risk of OD	Pilot study	1004 women consented. Randomised: 30; DR: 15 Sham procedure: 15
Le Ray (2007) France	To identify the risk factors for failure of MR in patients with OP or OT positions during labour and to study the caesarean rate in relation to the success of the rotation	Case-control study	MR performed on 796 women. After randomization: 79 successful MR, 68 failed MR

Caesarean Delivery = CD, Instrumental Delivery = ID, Manual Rotation = MR, Occiput posterior = OP, Occiput transvers = OT, Operative Delivery = OP, Persistent Occiput Posterior = POP.

Table 3. Quality assessment of the included studies.

Main Author (year) country	Quality assessment questions*										Total assessment Quality
	1	2	3	4	5	6	7	8	9	10	
Shaffer (2006) USA	Y	Y	U	U	U	Y	U	Y	Y	Y	Medium
Reichman (2008) Israel	Y	U	Y	Y	Y	N	Y	U	Y	Y	Medium
Shaffer (2011) USA	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	High
Le Ray (2013) France	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	High
Sen (2013) Japan	Y	Y	N	Y	N	N	U	U	Y	NI	Low
Graham (2014) Australia	Y	Y	Y	Y	Y	Y	N	N	N	NI	Medium

Note: Y = Yes; N = No; U = Unclear; NI = No Information
*Quality assessment questions
1) Did the study address a clearly focused issue? 2) Was the cohort recruited in an acceptable way? 3) Was the exposure accurately measured to minimise bias? 4) Was the outcome accurately measured to minimise bias? 5) Have the authors identified all important confounding factors? 6) Was the follow up of subjects complete enough? 7) Do you believe the results? 8) Can the results be applied to the local population? 9) Do the results of this study fit with other available evidence? 10) Were ethical issues considered?

Quality assessment questions for case-control study										
Le Ray (2007) France	Y	Y	Y	Y	U	Y	Y	Y	Y	High

Note: Y = Yes; N = No; U = Unclear; NI = No Information
*Quality assessment questions
1) Did the study address a clearly focused issue? 2) Did the authors use an appropriate method to answer their question? 3) Were the cases recruited in an acceptable way? 4) Were the controls selected in an acceptable way? 5. Was the exposure accurately measured to minimise bias? 6) Have the authors identified all important confounding factors? 7) Can you believe the results? 8) Can the results be applied to the local population? 9) Were ethical issues considered?

non-defined studies were evaluated by means of the CASP cohort study checklist. The methodical quality was measured on the basis of the CASP questions. The questions with the following response alternatives: Yes, No, Unclear, or No information were applied. The assessment process was inspired by Berg *et al*. [26].

Explanation of assessment of study quality: High quality: All or almost all of the checklist criteria were met. Unlikely that the conclusions will change. Studies met >50% of the criteria. Medium quality: Some of the criteria were not met or the study does not adequately address the criteria. Unlikely that the conclusions will change. Studies met >50% or 50% of the criteria. Low quality: Few or no criteria were met and criteria not adequately addressed. The study conclusions are likely to change. Studies met <50% of the criteria. The process of scoring the quality of the studies from high to low was inspired by Berg *et al*. [26] and discussed with the supervisor.

3.3.3. Analysis
Information from the included articles was summarized in a table and sorted by publication year. A thematic analysis was conducted [24] based on the literature review question "How can MR reduce VD, FD and CD" and the main findings of each of the included studies.

4. Findings

4.1. Study Characteristics and Methodological Quality

Seven studies were included in the literature review, none of which was a randomized controlled trial (RCT). There were two Cohort studies [14] [27] one Case-control study [13] and one Pilot study [28]. The rest were a mix of retrospective and prospective studies [29] [30] [31].

The article by Graham *et al.* [28] is a pilot study. Although it is of medium methodological quality, the results are not be of great importance for this paper due to the small population, that makes the study underpowered to test the efficiency of prophylactic DR. Nevertheless, it is a valuable study because it shows that a large double-blinded multi-centre RCT is feasible. Although the study by Sen *et al.* [31] was not excluded despite its low methodological quality, papers by Le Ray *et al.* [13], Le Ray *et al.* [29] and Shaffer*et al.* [14] were given the highest methodological were prioritised in the thematic analysis. The studies by Shaffer *et al.* [27] and Reichman *et al.* [30] were of medium quality.

4.2. Thematic Analysis

Six themes emerged: How can MR reduce VD, FD and CD?; Mode of delivery after MR versus expectant management; Mode of delivery after successful or unsuccessful MR; Technique and success rate; Midwives' involvement in the MR; and Predictors of successful or unsuccessful MR.

4.3. How Can Manual Rotation Reduce Vacuum Delivery, Forceps Delivery and Caesarean Delivery?

All of the included studies suggest that MR is a procedure to consider for reducing VD, FD and CD rates.

Interpretations of Findings
Having studied the conclusions of each study, there is a consensus that MR is a procedure worth considering as it can contribute to reducing VD, FV and CD.

The authors based their reasons for arguing that MR can reduce VD, FD and CD on two different findings. Reichman *et al.* [30], Shaffer *et al.* [14], Le Ray *et al.* [29] and Graham *et al.* [28] were influenced by the findings related to mode of delivery after MR versus expectant management.

Shaffer *et al.* [27], Le Ray *et al.* [13] and Sen *et al.* [31] referred to the findings related to mode of delivery after successful versus unsuccessful MR. The results will be presented separately as: mode of delivery after MR versus expectant management (Table 4) and mode of delivery after successful versus unsuccessful MR (Table 5).

Three of the included studies described rotation of OP positions [28] [30] [31], Four described rotation of both OP and OT positions [13] [14] [27] [29]. Only Le Ray *et al.* [29] referred to the success rate when comparing rotation from the two positions, although they did not observe any difference in the success of rotations from OT and OP positions.

4.4. Mode of Delivery after Manual Rotation versus Expectant Management

Reichman *et al.* [30] revealed that none of the women who underwent MR had a CD (Table 4). Shaffer *et al.* [14] reported a CD reduction rate of 32.8 % after MR. Although Le Ray *et al.* [29] only found a CD reduction rate of 1.7% after MR, there was a 15.4% reduction in the operative delivery rate. Both Reichman *et al.* [30] and Le Ray *et al.* [29] found an increase in instrumental delivery rates after MR of 27.4% and 13.8%. Shaffer *et al.* [14] reported almost identical instrumental delivery rates after MR and expectant management. Reichman *et al.* [30] and Le Ray *et al.* [29] found an increase in spontaneous vaginal delivery of 50.1% and 15.5% after MR. The study by Graham *et al.* [28] lacks the power to provide answers on rates.

Interpretations of Findings

The studies on MR versus expectant management differed in many ways, but an important similarity between Reichman *et al.* [30], Le Ray *et al.* [29] and Graham *et al.* [28] was that the diagnosis of the OP or OT position was made in the second stage of labour.

The expectant management group in the study by Shaffer *et al.* [14] reported POP positions diagnosed at delivery, which can explain the very high CD rate that might be due to failure to take account of OP position that would have

Table 4. Mode of delivery after MR or expectant management.

Main author (year) country	MR	Expectant management	P-value
Reichman (2008) Israel	SVD: 24 (77.4%)	SVD: 8 (26.4%)	P = 0.0001
	VD: 7 (22.6%)	VD: 15 (50%)	P = 0.0001
	CD: 0	CD: 7 (23.3%)	P = 0.0001
Shaffer (2011) USA	ID: 41%	ID: 39%	P = 0.373
	CD: 8.6%	CD: 41.4%	P < 0.001
Le Ray (2013) France	SVD: 168 (76.8%)	SVD: 68 (61.3 %)	NI
	ID: 33 (15.0%)	ID: 32 (28.8%)	P < 0.01
	CD: 18 (8.2%)	CD: 11 (9.9%)	P = 0.68
	OD: 51 (23.3%)	OD: 43 (38.7%)	P < 0.01
Graham (2014) Australia	SVD: 2 (13%)	SVD: 3 (20%)	NI
	VD: 6 (40%)	VD: 5 (33%)	P = 0.70
	FD: 3 (20%)	FD: 4 (27%)	P = 1.0
	CD: 4 (27%)	CD: 3 (20%)	P = 1.0
	OD: 13 (87%)	OD: 12 (80%)	P = 1.0

Caesarean Delivery = CD, Instrumental Delivery = ID, Operative Delivery = OP, Forceps Delivery = FD, Spontaneous Vaginal Delivery = SVD, Vaginal Delivery = VD, Undefined Vaginal Delivery =UVD, NI = No Information.

spontaneously rotated had they been diagnosed in the second stage of labour. OP positions are associated with a large proportion of emergency CD [18]. Of all emergency CDs, 18% are due to dystocia related to OP presentation [21].

Shaffer *et al.* [14] found almost equal instrumental rates after MR and expectant management. The high rate in the expectant management group was no surprise, as all the deliveries involved POP positions, a large proportion of which require a VD, FD or CD [3]. However, the high instrumental delivery rate in the MR group was not anticipated [14] and could be related to the relatively low success rate of 74%. Furthermore, there is no way of knowing whether the instrumental delivery took place after a successful or unsuccessful rotation. For this reason, there might have been many unsuccessful rotations that led to the need for an instrumental delivery. A high rate in successful MR could be related to the fact that MR corrects the foetal head in the birth canal, making VD or FD easier to implement.

The main results show an increase of spontaneous vaginal delivery after MR. While the CD and instrumental rates vary, there seems to be an overall decrease in the operative delivery rate after MR (Table 4).

4.5. Mode of Delivery after Successful or Unsuccessful Manual Rotation

Le Ray *et al.* [13] and Shaffer *et al.* [27] found that women with successful MR had a significantly lower CD rate ($p < 0.001$) (Table 5). In the study by Sen *et al.* [31] none of the successful MRs needed a CD.

The instrumental rate reported by Le Ray *et al.* [13] was higher in the successful MR group, but the difference was not significant.

Le Ray *et al.* [27] also demonstrated that women with a successful MR had a 50.9% increase in the spontaneous vaginal delivery rate. Shaffer *et al.* [27] showed that women who had a successful MR had nearly a three-fourths increase in undefined vaginal delivery.

Interpretations of Findings

Sen *et al.* [31] did not analyse MR as an individual procedure, but 17 cases of MR and 13 Posture changes. Although the small population led to a lack of power,

Table 5. Mode of delivery after successful or unsuccessful MR.

Main author (year) country	Successful MR	Unsuccessful MR	P-value
Shaffer (2006) USA	UVD: 97.9% CD: 2.1%	UVD: 65.7% CD: 34.3%	P < 0.001 P < 0.001
Le Ray (2007) France	SVD: 53 (67.1%) ID: 23 (29.1%) CD: 3 (3.8%)	SVD: 11 (16.2%) ID: 17 (25.0%) CD: 40 (58.8%)	NI NI P < 0.001
Sen (2013) Japan	UVD: 14 (100%) CD: (0%)	UVD: 11 (69%) CD: 5 (31%)	P < 0.05 P < 0.05

Caesarean Delivery = CD, Instrumental Delivery = ID, Undefined Vaginal Delivery = UVD, NI = No Information.

the conclusion is interesting. Only eight of the 17 cases had a successful MR, but none of the women with a successful MR needed a CD.

The instrumental delivery rate in Le Ray *et al*. [13] was higher in the successful MR group, but the difference was not significant, for which no explanation was given. However, it could be due to the fact that MR corrects the foetal head in the birth canal, making VD or FD easier to implement.

It is important to investigate whether the MR was successful or unsuccessful in order to understand the impact of rotation on mode of delivery. The results from the included studies on successful versus unsuccessful MR show a significant reduction in CD and an increase of spontaneous vaginal delivery after successful MR (Table 5).

4.6. Technique and Success Rate

The success rate varied from 47% to 93.3% (Table 6). Two main techniques, MR and DR, were used in the studies. Some of the studies used MR or DR as the main term for the rotation procedure, even though the other technique was also performed.

Interpretations of Findings
Having studied the results it appears that the choice of technique does not have a major influence on the success rate.

4.7. Midwives' Involvement in Manual Rotation

In all of the included studies midwives supervised the labour and attended the physician performing MR. Midwives who experienced in MR also performed the procedure in all studies, with the exception of Sen *et al*. [31] and Graham *et al*. [28].

4.8. Predictors of Successful or Unsuccessful Manual Rotation

MR has the best chance of success when performed at full dilatation [13] after engagement of the head [13] [31] and when done prophylactically before failure to progress [13] (Table 7).

5. Discussion

This literature review investigated how MR can reduce VD, FD and CD. Based on the inclusion criteria, we identified seven quantitative studies from France, Israel, the USA, Japan and Australia that investigate this issue. MR was considered after diagnosis of an OP or OT position during labour at a dilatation of at least 7 cm. A thematic analysis was conducted in accordance with the method described by Aveyard [24]. Six themes emerged: How can MR reduce VD, FD and CD? Mode of delivery after MR versus expectant management; Mode of delivery after successful or unsuccessful MR; Technique and success rate; Midwives' involvement in MR; and Predictors of successful or unsuccessful MR, all of which are important for determining how MR can reduce VD, FD and CD.

Table 6. Technique and success rate.

Main author (year) country	Technique	Rate of Successful rotations
Shaffer (2006) USA	No technique described, but in Shaffer 2011, which is based on the same study material, the technique was described.	74%
Le Ray (2007) France	When the uterus is relaxed, the operator places two fingers or the entire hand (right hand for left OP and OT-position and left hand for right OP and OT-position) behind the fetal ear. During contraction, while the patient is pushing, the operator uses the pressure of the fingers to rotate the anterior fetal head, moving the occiput relative toward the anterior pelvic girdle. Continuously monitored fetal heart rate throughout the procedure.	90.3%
Reichman (2008) Israel	The DR technique accounted for 97% of the rotations. The rest of the rotations were based on the MR technique. DR entails exerting pressure with the tip of the fingers to rotate the posterior fontanelle upward, toward the symphysis pubis after placing the tips of the index and middle fingers onto the edge of the part of the anterior parietal bone that overlaps the occipital bone, the posterior fontanelle. MR involves placing the whole hand in the birth canal, positioning the fingers under the lateral posterior parietal bone and the thumb on the anterior parietal bone. The head is then rotated.	93.3 %
Shaffer (2011) USA	One of two techniques: The first technique comprises placing the tips of the index and middle fingers onto the edge of the anterior parietal bone that overlaps the occipital bone, followed by rotation of the posterior fontanelle upwards towards the symphysis during a contraction or maternal expulsive efforts. The second technique involves cradling the occiput with the fingers under the lateral posterior parietal bone, with the thumb on the anterior parietal bone. Then slightly elevate using gentle pressure, rotate to OA and flex the foetal occiput.	74%
Le Ray (2013) France	When the uterus is relaxed, the operator places two fingers or the entire hand (right hand for left OP and OT position and left hand for right OP and OT position) behind the foetal ear. During contraction, while the patient is pushing, the operator uses the pressure of the fingers to rotate the anterior foetal head, moving the occiput relative toward the anterior pelvic girdle. Continuous monitoring of the foetal heart rate throughout the procedure.	90.1%
Sen (2013) Japan	No technique described.	47%
Graham (2014) Australia	DR fingers placed on the lambdoid sutures, rotating towards the pubic symphysis during contraction and with expulsive effort over three contractions. Flexion force was applied, to correct any deflexion. The head of the foetus was then held in OA position for further one to two contractions.	60%

Digital Rotation = DR, Occiput Posterior = OP, Occiput Transverse = OT, Occiput Anterior = OA, Manual Rotation = MR.

Table 7. Predictors of successful or unsuccessful MR.

Main author (year) country	Obstetric predictors of successful or unsuccessful MR	Maternal predictors of successful or unsuccessful MR	Other predictors of successful or unsuccessful MR
Shaffer 2006 USA	Labour induction and EDA were associated with higher rates of CD, but none of these factors increased the rate of failed rotation.	Multipara women and women under 35 years were more likely to have a successful MR.	No Data
Le Ray 2007 France	Attempted rotation before full dilatation tripled the risk of failure compared with rotation at full dilatation. MR for failure to progress increased the risk of failure compared with prophylactic rotation. No engagement (above station 0) increased the risk of failure.	Nulliparity and age > 35 were risks of failure.	Risk factors for failure increased with the number of attempts. 69.6% succeeded on the first occasion, but none of the fourth or fifth attempts were successful. MR at night failed twice as often compared with during the day
Sen 2013 Japan	MR has a better chance of success if the foetal head is at station 0, or further down.		There was no significant difference between the successful rotation rate when MR and Posture change were compared.

Epidural = EDA, Caesarean Delivery = CD, Manual Delivery = MR.

5.1. Mode of Delivery and Models of Care

All of the included studies suggest MR as a procedure to consider for reducing VD, FD and CD rates.

The main aim of midwives and obstetricians in maternity care is to protect the health of mother and child. The two professions are based on two fundamentally different models of care [32]. Midwives are responsible for normal labours, due to their expertise in protecting, supporting and enhancing the normal physiology of labour [32]. Physicians have a background in medicine and are responsible for the pathologic aspects of labour, with often involve diagnosing and treating complications [32]. In reality, despite the fact that these two basic differences are non-debatable, the two professions share information, expert opinions and research, working together to holistically safeguard both the physiological and the pathological labour.

Labours with OP and OT positions often start normally but pathology can develop during the process. These malpositions are diversities of foetal rotation and while not pathological, involve a risk of pathology. Obstetricians and midwives work together to protect the health of mother and child, but how to manage an individual labour and decide when to intervene can be a subject of debate, especially between midwives and obstetricians.

It is relevant to argue that most OP positions rotate spontaneously and for that reason expectant management is the best approach. Nevertheless, OP and OT positions are associated with a greater risk of prolonged second stage labour and maternal morbidity [1]. As many as 5.5 to 8.3% of OP positions are persistent [5] [16] of which 68% require an OD [3]. Many OP positions rotate during the first stage of labour [15].

Le Ray *et al.* [13] and Sen *et al.* [31] state that a predictor of successful MR is performing the procedure at full dilatation. This indicates that MR should be performed in stage two of labour, at which point many of the OP presentations that spontaneously rotate have already done so. Le Ray *et al.* [13] found that MR has a better chance of success when performed prophylactically before failure to progress. In expectant management, the indication for MR is likely to be failure to progress, which reduces the chance of successful MR.

Because midwives are responsible for monitoring normal labours and most labours with OP and OT positions start normally, it is their duty to diagnose the OP or OT position. Many midwives believe that expectant management is the best way to manage labour because they understand it as a normal physiological process and therefore try to avoid unnecessary interventions. However, for expectant management to support natural physiological labour it is necessary to monitor the rotation and presentation of the foetus when assessing progress. The results from the included studies show a reduction in the OD rate and an increase of SVD after MR versus expectant management (Table 4). For this reason MR can contribute to protecting, supporting and enhancing the normal physiology of labour by facilitating SVD.

Midwives' and physicians' different models of care [32] can also have conse-

quences for the mode of delivery, in that a midwife performs MR to support and enhance the normal physiology of labour. In other words, the midwife performs MR and then waits to see if the labour proceeds normally, as this is the basic philosophy of the midwifery profession. On the other hand, obstetricians might find it easier to convert the MR procedure into an ID due to their underling expectation to treat and the fact that performing obstetric interventions is their area of expertise. This can explain the high level of ID after successful rotations in Le Ray *et al.* [13].

5.2. Technique and Experience

The included studies demonstrate the great importance of successful MR for reducing VD, FD and CD (Table 6). For this reason, we investigated the predictors of successful rotation, only to find that none of the studies highlighted the actual MR technique as a predictor of success. As MR is a handcraft with wide interpretations, it was interesting to explore the different techniques used and the success rate in each study (Table 5). However, the choice of technique did not seem to influence the success rate and instead experience appears to be the decisive factor. In most studies experienced personnel performed MR or supervised less experienced colleagues. This is a traditional and valuable way of working as it provides inexperienced personnel with hands on experience, an opportunity to ask about the procedure and receive advice [33]. However, gaining experience requires midwives and physicians to perform MR. Two large surveys were conducted in Australia and New Zealand to increase understanding of midwives' and obstetricians' attitudes towards MR [34] [35]. It was found that while only a minority of obstetricians and midwives perform MR, most consider the procedure acceptable. Midwives and Obstetricians would be willing to perform MR if it was known to decrease OD from 68% to a median of 50%. From my own experience as a midwife, I believe that this survey is relevant and also reflects Norwegian Midwives' and Obstetricians' attitudes towards MR. Experience is of great importance for achieving the best possible results in most handcrafts [7]. Le Ray *et al.* [13] states that the low failure rate in the study is probably related to the efficacy of this technique when used routinely.

5.3. Midwives' Role in Labour and Involvement in the Manual Rotation Procedure

OP and OT positions are associated with a prolonged first and second stage of labour [1] [5]. Admission to the maternity ward can be a long and painful experience for the woman and a challenge for the midwife. In addition to emotional support, the midwife provides pain relief and information, as well as monitoring the progress of both mother and foetus. Recent research confirms that continuous care in labour contributes to increased SVD, decreases the need for analgesia, leads to less dissatisfaction and can reduce the need for CD and instrumental delivery [23]. There are many ways of supporting women in labour. The best support is dependent on what becomes a challenge in each individual labour and the

woman's motivation and resources, both physical and psychological. The study on continuous support for women during childbirth [23] does not define the concept. Other than suggesting that it can be emotional support, comforting measures, information and advocacy, it was also stated that the best support was given by someone other than hospital staff. This indicates that the midwife's special competence regarding the labour process may not be the only support needed to facilitate spontaneous vaginal delivery. However, because of the risk factors involved, when faced with OP or OT positions, the midwife's competence is important for providing adequate comfort measures, information and advocacy to prevent maternal complications or to support the woman when the obstetrician has to intervene. Few other professions in the obstetric field work as close to the individual women in labour, which gives midwives a huge advantage in terms of their responsibility to monitor the birth process and therefore also the rotation of the foetus during labour. A diagnosis of OP position made early in labour is important because the MR rotation may be easier to perform before the labour fails to progress [13]. The midwife attending the labour can perform the MRor in the event of lacking the necessary skill, can ensure that the situation is evaluated at the right time by a midwife or an obstetrician with competence in performing MR.

Midwives supervised labours and attended doctors performing MR in all of the included studies. They also performed MR in all studies with the exception of Sen *et al.* [31] and Graham *et al.* [28].

5.3. Limitations of this Review

This literature review has several limitations. A meta-analysis was not possible due to the diversity of the aims, design and population in the included studies [24]. None of the studies were RCTs and of the seven included studies, only three had a high methodological quality. When conducting a review, the researcher is in danger of making choices regarding the selection of studies and data extraction that could lead to the risk of bias [36].

6. Conclusion

In conclusion, a successful MR can reduce CD rates and facilitate spontaneous vaginal delivery. However, experience is necessary to achieve successful rotations. MR is worth considering as there are few risk factors involved.

7. Implications for Practice

It is important that midwives diagnose the OP or OT position early in labour so that MR can be considered at the right time, thus increasing the chances of success. Midwives have the benefit of being close to the individual women, enabling them to evaluate the progress of labour and therefore the rotation of the foetus. Midwives have a great opportunity to achieve high competence in this area and may prevent labours with malposition from developing a pathological pattern. However, to make MR a safe treatment option there is a need for training pro-

grammes that focus on diagnosing foetal position and presentation.

It is also essential that the documentation during labour is designed to include the position and presentation of the foetus in the same way as it requires information on dilatation and descent of the foetal head. This will make diagnosing the foetal position a necessity when documenting all labours, which implies that midwives will have to develop or improve their skills.

When it comes to making MR a routine treatment option, an important implication for practice is positive commitment from midwives and doctors. Commitment and focus are required in order to ensure that diagnosis of foetal position and presentation becomes a natural part of evaluating the progress of labour.

There is also a need for RCTs to verify the results of the studies in this review. Two double-blinded multicentre RCTs are now being conducted in Australia [37] [38] that may provide results that can be incorporated into professional guidelines for obstetricians and midwives.

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Contributors

The study was designed by C.O. The report was written by C.O. E.S. supervised the study.

Conflicts of Interest

The author's declare there are no conflicts of interest.

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Risk Factors with Intimate Partner Violence among Women Seeking Emergency Care

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Abstract

Background: Identifying women at risk for violence caused by intimate partner violence is difficult in connection with visits at emergency department. **Aims and objectives:** The aim of this study was to explore and describe risk factors of IPV reported by women in connection with seeking emergency care, **Design:** This study is part of a larger study using an explorative and comparative design. **Method:** Based upon data from a questionnaire and some demographic data, 82 women who reported to have experienced intimate partner violence answered the Danger Assessment Scale. **Results:** The results showed that the violence escalated in frequency and severity when a weapon such as a knife or gun was used to harm the women. When the abuser used narcotics and threatened the woman with a weapon, the risk of being injured increased. The odds for being threatened to death when the abuser was reported to use narcotics and illegal drugs was about thirteen times higher compared to the case when the abuser was not using narcotics. Other life threatening factors were discovered such as the man's capability of killing the woman. **Conclusion:** By using a questionnaire about the violence, healthcare personnel can identify women who are at risk of being severely injured or killed. By identifying these women, one can take action to provide for their safety. **Relevance to Clinical Practice:** Using the Danger Assessment instrument can facilitate health care personnel's ability at emergency departments to identify women at risk for lethal violence.

Keywords

Intimate Partner Violence, Lethal Violence, Abuse Women, Nursing Care, Emergency Care

1. Introduction

Intimate Partner violence (IPV) is a multifaceted global problem creating prob-

lems for the abused woman and her family [1] [2]. According to research [3] in Finland, intimate-partner homicides (intentional and unintentional murder) made up a larger percentage of homicides against women than in Sweden or the Netherlands. In spite of this, the percentage of female victims killed outside close relations was almost the same in Finland (20 per cent) and in Sweden (24 per cent), and it was possible that it was more or less the same in the Netherlands. In Sweden an average of sixteen women are killed by a man who is involved in an intimate relationship with the victim at the time of the offence, or has been involved in such a relationship with the victim at some point prior to the offence [4]. According to Campbell *et al.* [5] and Sabri *et al.* [6], women were murdered by intimate partners, husbands, lovers, ex-husbands and ex-lovers more often than by any other category of killer. The most severe health consequence of intimate partner violence is homicide (manslaughter and murder), causing more than half the homicides to women in the United States each year [7]. It is stated that, two women are murdered, on average, each day in Guatemala and is concluded that a woman is killed every eight hours in South Africa by an intimate partner [8] [9]. Identifying IPV in emergency care is challenging. A vital question is if nurses and physicians at emergency departments have tools and possibilities for identifying IPV and risk for lethal violence and thus ability to take actions that might prevent homicides. Minimal research concerns risk factors in relation to IPV, the severity and occurrence of the violence among women seeking care at an emergency department. Sabri *et al.* [6] indicate that abused women presenting with severe injuries in health care settings are likely to be at high risk for being killed. This study focused on exploring and describing risk factors of violence among women who reported intimate partner violence in connection with seeking emergency care.

2. Background

Identifying and assessing the risk of homicide among women is not easy. Despite IPV has received increasing international attention as a public health and human rights concern, the killing of women is still not well understood. Research has noted the importance of assessing the risk of IPV (Campbell [5] and Dobash [10]). Campbell [5] stated that several risk factors have been associated with increased risk of homicides of women and men in violent relationships. Another factor, which may be of importance, is the perpetrator's mental health. Rying [4] explains that it is very common that the perpetrators, who kill, suffer from some form of mental illness or other mental disorder. Eighty per cent of the men who kill women in the context of an intimate partner relationship suffer from mental disorders such as depression and emotional problems. It is however not only the violent persons that may suffer from mental disorder, the women's health is also negatively affected. Several studies [4] [5] [10] have documented increased risk for a number of adverse physical, mental, reproductive, sleep-disorders, self-harm and other health outcomes among those who have experienced intimate partner violence and sexual violence. Previous research has shown that many

women suffer from Post-Traumatic Stress Disorder (PTSD), anxiety and depression [11] [12]. These mental health effects of chronic and severe violence are, in turn, risk factors for suicidal ideation [9] [13] [14] [15]. It can be discussed if increasing severe violence and as warning signals. Questions that concern risk factors may also help women to realize risks for being lethal injured. Such questions may also facilitate communications about their life situation, health and the violent relationship when women are seeking care for their injuries or health problems at emergency departments. Caretta [16] suggests that women's health problems in relation to IPV should be addressed by using screening and support. It is known that health care professionals find it difficult to ask patients about domestic violence and it is possible that these types of questionnaires will help nurses to identify and address the issue of IPV [17]. Research conducted at Swedish psychiatric services [18] has shown that 63% of women seeking such care reported being abused and in a review by [19], about 30% of the women seeking care at psychiatric outpatient clinics reported abuse. However, very little is known about how to identify risk for lethal violence and the risk of being killed among women in Sweden who are seeking care at emergency departments. By identifying this, actions can be taken by the health care personnel, which might prevent homicide.

The aim of this study was to explore and describe risk factors of IPV reported by women in connection with seeking emergency care. The following questions guided this study:

What IPV risk factors do women who were seeking care an emergency department report? Are there any relationships between these risk factors?

3. Methods

3.1. Study Design

This study is part of a larger study using an explorative and comparative design [20]. During September 2008 and June 2009, 300 women who were seeking treatment at an Emergency Department (ED) at a hospital in Sweden (40,000 inhabitants) and who fulfilled the inclusion criteria, were consecutively invited to participate in the study by answering two questionnaires. These were a Swedish version of Abuse Assessment Scale (AAS) [21] and a translated version of Danger Assessment Scale (DAS) [22]. Eligible subjects were female who were at least 18 years old, understood Swedish or English and had cognitive ability to answer questions. Of these 300 women, 234 (78%) answered the AAS and DAS and of these 82 women reported experiences of IPV sometime during their lifetime. In this study, the findings from DAS will be reported.

Two trained female nurses at the ED, with experience of caring for abused women, invited the women by giving them information about the study and that participation included answering two questionnaires. Their right to anonymity and that their participation was voluntary. After acceptance, an envelope and the questionnaires were handed over and the women were encouraged to answer the questionnaire and put it in the envelope and seal it. This information and pro-

cedure was performed face to face with no other persons present in the room. The instrument used in this study is the DAS instrument designed and developed by Jacqueline Campbell to assess likelihood of lethality or near lethality occurring in a case of intimate partner violence. The questionnaire is scored dichotomously at yes/no responses [5] [22] [23]. The DAS was scored by counting the "yes" responses, with a higher number indicating more risk in the relationship. The DAS version 2004, which consists of 20 items, was translated from English to Swedish (see supplement DAS) by three native Swedish spoken researchers who were familiar with English language. The translated text was then translated back to English by three other researchers, familiar with both Swedish and English. There were no differences found concerning the introductory text and the instructions. The authors decided to not only to refer to the gender "he" as in the original version, but use both genders he/she as some women may experience violence in lesbian relationships (see Box 1). The first question about frequency and severity during the last year was reworded and changed into two separate questions: Has the physical violence increased in frequency during the last year? And has the physical violence become more violent and severe during the last year? Additionally, other questions were added "Is he/she violent to your children? And is he/she violent outside home? Has he/she ever threatened to commit suicide?" Construct validity for this instrument has been derived from the original instrument. The relevancy of the changes and new questions were discussed with J. Campbell. Reliability was not established for this instrument; the questions are similar. Thus the Swedish version consists of 25 questions. We decided to weight all variables the same and only count the "yes" answers: Less than 8 means danger, 8 to 13 means increased danger, 14 to 17 means severe danger and 18 to 25 means extreme danger. However, in accordance with Campbell's statements each variable/factor where the woman had answered "yes" should be seen as a danger for her life. In conjunction with the data collection of the DAS, some demographic data was also collected. These data were: women's age, number of children living at home, education, employment or not, salary/year and marital status.

3.2. Data Analysis

Descriptive statistics, such as median (md), mean and standard deviation (SD), and analysis were applied using Statistical Package for the Social Sciences (SPSS version 21). Demographic data and variables from the DAS were compared using non-parametric test. Fisher's Exact Test and Chi square test were used to test the significance of proportions to compare frequencies. For estimating the probability of an event to occur [24] Odds Ratio (OR) was calculated, with 95% confidence interval (CI).

Ethical permission was granted earlier from the Ethical committee in Gothenburg as this study is part of a larger study. The women were given oral and written information about the study, and were informed of their rights to anonymity, rights to confidentiality and their rights to termination of the study.

BOX 1. Danger assessment. A modified version for Swedish population [23].

Several risk factors have been associated with increased risk of homicides (murders) of women and men in violent relationships. We cannot predict what will happen in your case, but we would like you to be aware of the danger of homicide in situations of abuse and for you to see how many of the risk factors apply to your situation.

Using the calendar, please mark the approximate dates during the past year when you were abused by your partner or ex-partner. Write on that date how bad the incident was according to the following scale:

1) Slapping, pushing; no injuries and/or lasting pain
2) Punching, kicking; bruises, cuts, and/or continuing pain
3) "Beating up"; severe contusions, burns, broken bones
4) Threat to use weapon; head injury, internal injury, permanent injury, miscarriage, choking
5) Use of weapon; wounds from weapon

(If any of the descriptions for the higher number apply, use the higher number.)
Mark Yes or No for each of the following.
("He" refers to your husband, partner, ex-husband, ex-partner, or whoever is currently physically hurting you.)

                                        Yes/No
1) Has the physical violence increased in severity?............
2) Has the violence increase in frequency over the past year?............
3) Is there a gun in the home?................
4) Does your partner own a gun?...............
5) Have there been threats with a weapon/the use of weapon within the last year?...................
6) Has he/she ever used a weapon against you or threatened you with a lethal weapon? ……………..
(If yes, was the weapon a gun?..............................)
7) Have you left him/her after living together during the past year?…..
(If you have never lived with him, check here……..)
8) Is he/she unemployed?...............
9) Does he/she threaten to kill you?............
10) Has he avoided being arrested for domestic violence?...............
11) Do you have a child that is not his/hers?........
12) Has he/she ever forced you to have sex when you did not wish to do so? ………..
13) Does he/she ever try to choke you?...............
14) Does he/she use illegal drugs? By drugs, I mean "uppers" or amphetamines, Meth, speed, angel dust, cocaine, "crack", street drugs or mixtures…………………….
15) Is he/she an alcoholic or problem drinker?...................
16) Does he/she control most or all of your daily activities? (For instance: does he tell you who you can be friends with, when you can see your family, how much money you can use, or when you can take the car? ………….
17) Is he/she violently and constantly jealous of you? For instance, does he say "If I can't have you, no one can"?..................
18) Have you ever been beaten by him/her while you were pregnant?............
19) Has he/she ever threatened or tried to commit suicide?................
20) Does he/she threaten to harm your children?
21) Is he/she violent towards your children?................
22) Do you believe he/she is capable of killing you?....................
23) Has he/she threaten to kill you?....................
24) Does he/she follow or spy on you, leave threatening notes or messages, destroy your property, or call you when you don't want him/her to?............
25) Have you ever threatened or tried to commit suicide?...............
Total "Yes" Answers:
Thank you. Please talk to your nurse, advocate or counselor about
what the Danger Assessment means in terms of your situation

Women were never orally asked about IPV and the nurses at the ED who handed over the questionnaires had no information and possibility to connect a

patient with a specific answered questionnaire, neither could the researchers. Due to sensitivity of the study, it is difficult to know if any hidden feelings could be triggered, extreme caution was taken to avoid triggering feelings that were deeply hidden. Counselling was offered as a routine, to all women who were seeking care at the ED.

4. Results

The 82 abused women's mean age was 43 years (SD 15.2; r = 18 - 78 years) with a total number of 81 children (Md 2). Of these 82 women, 58 had a child between the ages of 0 - 18 years old. Of the cases where relationship status could be established; 45% (n = 37) were married or cohabitating and 40% (n = 33) were single. 14.6% (n = 12) of the data was missing.

The marital status *i.e.* if the woman was married, cohabitating or single, had no significance for increasing or more severe violence. A total of 23 women answered the question about yearly income, showing a low income (mean 211 832SEK). Fifteen (18.3%) women disclosed that their abuser was unemployed. Stalking and being spied on was experienced by 35.4% (n = 29) of the women. Of the women (Table 1) 18.3% (n = 15) stated that the abuser was also violent outside the home and it was found that 19.5% (n = 16) of the men avoided being arrested by the police and 37.8% (n = 31) women revealed that their abuser was an alcoholic or had problem with alcohol. Of the women, 18.3% (n = 15%) reported that the abuser was using illegal drugs such as narcotics. A total of 36.6% (n = 30) of the women felt the men were controlling their daily activities and

Table 1. Abuse women's experience of severe violent threats and severe violence from an intimate partner' relationship (IPV).

Type of threat/violence	Yes	No	Total	Women's mean age in years yes/no
IPV more frequent in the last year	6	70	76	49/42
IPV more violent in the last year	8	68	76	43/46
Threatened with a weapon	6	69	75	40/43
The abuser tried to choke the women	16	59	75	37/43
Women threatened to commit suicide	25	51	76	43/43
The abuser threatened to commit suicide	16	60	76	35/43
The partner threatened to kill the women	23	52	75	43/43
The women's assumption of their partners capability to kill	18	57	75	41/43
The abuser was violent against children	2	28	30	54/43
The abuser threatened to harm the children	9	60	69	46/43
Violent outside home	15	55	70	37/43

37.8% (n = 31) women also experienced their partner to be extremely jealous.

4.1. The Occurrence of Risk Factors and Increased Severity of Violence

The data showed 31 women, 18 - 78 years, answered yes to less than 8 questions showing a danger, and 20 women in the same age group answered to 8 - 13 questions showing increase risk, while 9 women answered yes to 14 - 17 questions between the ages of 31 - 55 years of age showing a severe risk and 4 women ages 41 - 45 answered yes to 18 - 25 questions showing an extreme risk of being violently injured and risk of homicide. 16 of the abused women answered no to all questions on the DAS and two of the abused women did not answer. 7.3% (n = 6) of the women disclosed that the violence had become more frequent within the last year, while 9.8% (n = 8) disclosed that the violence had become more severe (Table 1). The study showed 6.1% (n = 5) women tried to leave her abuser during the last year. However, 12.2% (n = 10) of the women disclosed never living with their abuser. There was some significance between the violence increasing in frequency and the severity of violence (p = 0.000).

4.2. Using a Weapon to Harm the Woman

The result shows 9.8% (n = 8) women disclosed a weapon existed in the home such as a knife or gun. While 11% (n = 9) disclosed that their abuser owned a handgun. It was disclosed (Table 1) by six women (7.3%) that they had been threatened with a weapon. Of the 82 women 19.5% (n = 16) women answered that a weapon was used to harm them and of these, 4.9% (n = 4) women answered that a gun was used.

4.3. Threats and Capability of Killing

As can be seen in Table 1, 22% (n = 18) of the women reported that their partner was capable of killing them, while 28% (n = 23) stated that they had been threatened to death and 19.5% (n = 16) women reported that the partner had tried to choke/strangle them. Significant differences were found between the women's reporting of their abuser's unemployment and the women's thoughts about their abuser's capability of killing (p = 0.004). Of the men who were unemployed (n = 15), 53% (n = 8) were identified as capable of killing the women, while 17 % (n = 10) of all the employed (n = 59) men were capable. A total of 30.5% (n = 25) women disclosed that they themselves had threatened to or tried to commit suicide. However, sixteen women (19.5%) reported that the abuser, threatened to commit suicide. The odds for being threatened to death when the abuser was reported to use narcotics and illegal drugs was about 13 times higher compared to the case when the abuser was not using narcotics (OR12.59, CI = 2.74, 54.65). The same risk was found in those cases where the women reported that the abuser is seen capable of killing and is using narcotics or other illegal drugs compared to those cases where the abuser was not using narcotics (OR = 13.77; CI = 2.96, 60.78). The odds for the abuser threatening with suicide if the

abuser was jealous compared to not jealous as reported by the women were almost 11 times higher (OR = 10.59 CI; 2.48, 47.68).

4.4. Pregnancy and Threats to Women and Her Children

A total of 74 women answered the question about violence during pregnancy. Of these 15 reported to have been pregnant during the time when having a relationship with the abuser while 28 had not been pregnant during the relationship. As many as 41% (n = 34) of the women disclosed being forced to have sex. However, 26.8% (n = 22) women had no children with their abuser and nine women (11%) stated that their partner threatened to harm the children. Two women reported that their partner was violent to the children (Table 1). A significant difference was found in women's reporting of the abuser's threats to harm children and using narcotics. More women reported that if the abuser used narcotics the abuser threatened to harm the children (66%) compared to women's reporting where the abuser did not use narcotics (16%). The occurrence of violence did not increase if the child was not the abuser's biological child.

5. Discussion

In this study, we found that the mean age of the abused women was 43 years, which is in line with the findings by de Boinville [25] and Campbell *et al.* [5] showing women who reported increased frequency and severity of violence were ages 43 - 49 years. This study shows no significant difference in violence between married and not married women. Of the abused women 18% reported that their partner was unemployed. A relationship, between unemployment and women's reporting of the partner's ability to kill, was found in the studies by Auchter [26] and Moreno *et al.* [2]. The yearly mean income among the women was relatively low. However, this must be interpreted with caution as only 23 of the 82 women reported yearly income. Campbell *et al.* [5] and Dobash *et al.* [10] found that women's risk of intimate partner homicide and violence is greater among the young and those with low household income. It was found that several women were at risk for being killed, and significant amount were at very high risk which is in line with several findings [5] [10] [26] Our findings demonstrated that 30% - 40% of the women reported that their partner spied on them, tried to control their daily activities and were extremely jealous. Research [27] indicates that the most dangerous time for a battered woman is after she ends the relationship. Several men in the study threatened to commit suicide. This may indicate that the violent partner's health is unstable. Previous research [4] [5] [28] disclosed that there is an increased risk of homicide when the man is suicidal. Our findings are in line with other studies [25] [29] showing abused women reported to have threatened to commit suicide and had suicidal thoughts. Several studies [25] [27] [30] [31] highlighted that the risk of suicide is higher among abused women than non-abused, which also puts them at higher risk for mortality. Women (28%) also reported that their partner threatened to kill them and about 20% had tried to choke or strangle the women. Such experiences may result in

PTSD.

The abuser's use of narcotics and illegal drugs seem to be an important risk factor in this study. In this study, the risk for threatening to kill the women was estimated to be 13 times higher if the abuser was reported to use narcotics. This finding is in accordance with The Advocates of Human Rights [27], which concluded that batterers who are heavy drug and alcohol abusers are more likely to kill. The abuse of alcohol and drugs has also been found to be a factor in cases where women kill their batterers. Women are often more afraid when men use drugs and alcohol and are more likely to use violence to protect themselves during an assault. An abuser's prior attempts to choke or strangle the victim are also an indicator of extreme danger. Significantly, more women reported that the partner threatened to harm the children if the person used narcotics. Two women reported that their partner was violent towards their children. These figures may be higher as women may be afraid of reporting violence against children as they might feel afraid of losing custody of the children or that the social welfare authority will take the children from them. This because registered nurses and physicians are, according to the law, obliged to report to the Social welfare authority if children are maltreated [32]. The DAS is a useful and helpful instrument to identify women exposed to violence and by investigating the relationships between risk factors identify at least some questions health care personnel would be recommended to ask. This could provide healthcare professionals a possibility to, in cooperation with the women, develop and activate safety plans and/or caring activities.

It is recommended that each ED should ask or use a questionnaire about experienced or ongoing abuse, type of abuse the women is an object for as well as if the abuse has escalated (danger). The questionnaire used in this study, requires further development with less number of questions and if the women respond yes to have experienced abuse or is ongoing; a strategy for asking more questions should be available. Power analysis was not calculated in the DAS. According to Polit (2004), power analysis is a method of reducing the risk of Type II errors and for estimating their occurrence. Statistical Significance levels in the study was $p < 0.05$, limiting the risk of Type II error. To limit bias in this study and increase trustworthiness, the content of the DAS were checked and reached with professional's research team and together with ED nurses.

6. Limitations

Several limitations should be noted. There was some data missing and the CI was found to be wide so the certainty of how big the odds really are is uncertain, it may be lower or higher. The number of participants in the study is small, which also has to be taken into consideration. The DAS could also be developed to contain questions about children who are exposed to or have witnessing violence. This study is one of the first in its kind in Sweden in an emergency setting. This study is showing that it is possible to identify women at extreme risks for being killed or severely injured. However, this also means that health care

professionals should have support and strategies for dealing with these complex cases and issues. The findings are in accordance to agree with Campbell *et al.* [5] study concerning lethal violence against women at extreme risk for homicide.

7. Conclusion

Women who visited an ED reported to have experienced IPV and were at risk for being killed. The most important risk factors for being threatened to death and violence and threats against children were the partner's use of illegal drugs/narcotics and threats to commit suicide. Even unemployment could be seen as a risk factor. These may indicate that IPV is closely connected to drug abuse, mental illness or diseases.

Relevance to Clinical Practice

Health care professional's knowledge about risk factors when caring for abused women is vital for taking adequate actions and develop questionnaires or care actions that may contribute to identifying women at risk. The abuser's use of narcotics and illegal drugs as well as threats to commit suicide and unemployment can be seen as important issues to ask about when caring for women in different health care settings as these can be seen as very important risk factors for increasing violence and risk for homicide.

There are several practical implications in approving the ability to predict severe violence by abusers (*i.e.* violence likely to result in injury or death). Extreme caution and attention should be given when women disclose that their abuser is suicidal; we believe there is an increased risk of murder-suicide meaning the man kills the woman then kill himself. Healthcare providers should note that it is during the "meeting" with the abused woman one can detect the signs to prevent a murder. Survivors may be reluctant to disclose their victimization whether to law enforcement or to family and friends for a variety of reasons including shame, embarrassment, fear of retribution from perpetrators, or a belief that they may not receive support from law enforcement.

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Scientific Research Publishing

Details of Particulars of Benefit Finding through the Experiences of Breast Cancer Patients Analysis on Breast Cancer Journals Written by Patients

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Abstract

This study aims to analyze the descriptions in breast cancer journals written by patients and to understand the experience of benefit finding among patients with breast cancer. We selected 22 such breast cancer journals written by patients published after 2000 in Japan. The extracted statements related to benefit finding of patients experiencing breast cancer from the 22 journals were subjected to a qualitative analysis, and the following seven benefit finding elements were extracted: "Gratitude toward others", "Benefits due to cancer", "Happiness at living a normal life", "Realization of and satisfaction with my growth", "Awareness of the meaning of my existence", "Hopes for life", and "Willingness to contribute to others". These benefit findings suggest that these particulars fulfill cultural, practical, spiritual, and social meanings, and lead to self-revaluation in daily life.

Keywords

Breast Cancer, Journals Written by Patients, Benefit Finding

1. Introduction

The incidence and mortality of breast cancer in Japan is increasing [1]. Patients with breast cancer live with an awareness of the "disease" for a long time because there is a risk of recurrence and metastasis of the cancer for ten years after surgery, the common initial treatment. For this reason, it has been anticipated that they will suffer from pain of various kinds and many studies have addressed physical and mental pain after surgery for breast cancer [2] [3] [4]. Further,

Taylor [5] and Wand [6] have addressed the benefit finding (BF) that improves the will to live of patients with breast cancer. However, this topic is not well studied in Japan. Benefit finding encompasses the positive changes in attitudes brought about by the "experience of a disease", and is considered a cognitive response for patients to adjust to stressful circumstances [7]. We expect that an analysis of the conditions and the background where BF occurs, also among Japanese patients with breast cancer, will make it possible to identify ideas to assist in the support of patients so that they can lead a more comfortable life without deterioration in the quality of life during the long periods of life with the disease.

This study analyzes data obtained from "narratives by patients". Since 1998 when a study on Narrative Based Medicine by Greenhalgh and Hurwiz [8] attracted attention, research of "narratives by patients" has come to be regarded as an important method to promote patient-centered health care. Patients face the issues themselves by talking about their experience, and health care professionals show understanding of the patients and family by listening [9] and through this exchange the parties involved gain ideas to think about the clinical care. With this background, breast cancer journals written by patients (Journals) have been analyzed and utilized in research studies.

As concepts similar to BF, resilience, and post traumatic growth are also concepts known as adjustments to stress and trauma. In this study we perform an analysis using the concept of BF as the actual intensities and degrees of stress and trauma at surgery for breast cancer are not clear.

2. Purpose

This study aims to understand details of BF for patients with breast cancer experience arising from the "disease", and to gain ideas useful in the support of patients with breast cancer, based on the data from an analysis of descriptions in journals published in Japan.

3. Methods

3.1. Definition of Terms

Breast cancer journals written by patients (Journals): here defined as "private records where patients describe the process of struggling with a disease" as defined by Kadobayasi [10].

Benefit finding (BF): defined as personal positive changes brought about by the experience of breast cancer (and a cognitive response in adjusting to stressful circumstances).

3.2. Research Period

Data were collected from May to December, 2013.

3.3. Literature Reviewed

We searched books related to breast cancer in the Web database of "Paramedi-

ca", a second-hand bookstore specializing in private volumes where patients describe the process of struggling with a disease, and identified 199 volumes. Of these 166 were available as of August 25, 2012, and excluding 61 volumes published before 2000, we reduced the number to 105. Of the 105 we excluded 22 volumes that met the following exclusion criteria: 1) lack of cognitive and mental descriptions, 2) the author is not a patient, 3) the author is not Japanese, and 4) includes cases of other kinds of cancers. After examining the content of the remaining 83 volumes, we chose and analyzed 22 which were determined to have been written well enough to be analyzed. In Japan most laws related to dealing with cancer issues were established in the present form after the year 2000. Considering this background, in the paper we decided to focus on and analyze the books published in 2000 or later.

3.4. Analysis

Having read through the 22 volumes, we extracted statements that express positive changes brought about by the experience of breast cancer. After coding the statements and paying attention to similarities, we assigned categories and subcategories.

3.5. Reliability and Validity

Through discussion with co-researchers during the process of the analyses, we ensured reliability and validity.

3.6. Ethical Considerations

In using data of struggles with diseases published and openly available in such journals, we took care to handle the matters reported not to violate copyright, not to harm the persons and personalities appearing there, or bring dishonor to the authors.

4. Results

Table 1 details the 22 breast cancer journals written by patients (Journals). All the authors were women, aged 33 to 70 when the journals were published, and two were published after the authors had passed away. The duration of the struggle with the disease till the publication was from one year and seven months to 30 years. Extracting statements that were considered to be related to benefit finding (BF) from the 22 journals and performing a qualitative analysis, we extracted seven categories: "Gratitude toward others", "Benefits due to the cancer", "Happiness at living a normal life", "Realization of and satisfaction with my growth", "Awareness of the meaning of my existence", "Hope for life", and "Willingness to contribute to others". The results of this analysis are discussed in the following sections by category and are shown in Table 2. For notation style, double single marks (') are used for category names, angular brackets (<>) for sub-categories, square brackets ([]) for code names, and italics (*italics)* for quotations from the narratives.

Table 1. Overview of the journals.

Author, Year	Occupation	Title	Publisher
1. Machiko MATSUI (2000)	sociologist	Living with Cancer in America	The Asahi Shimbun, Co.
2. Eiko UCHIDA (2001)	patient advocacy group leader	I hope to Pair Boobs	Hokusui*
3. Michi NAKAJIMA (2003)	nonfiction writer	Fighting Cancer, Learning from Cancer, Living with Cancer	Bunshun Bunko*
4. Minori MIYATA (2003)	poet	Breast Cancer-Decision Making for My Life	Lyonsha*
5. Reiko TACHIKI (2004)	journalist	Boobs in Paris and Boobs in Japan	Shueisha, Inc.
6. Mariko YAMAGUCHI (2004)	housewife	Why My Breast Cancer Was Overlooked What Can Be Done by Me Who Have Half a Year to Live	The Asahi Shimbun, Co.
7. Setsuko TAHARA (2004)	ex-caster	Farewell Note-Breast Cancer Journal with Laughter	Shueisha, Inc.
8. Setsuko TAHARA (2004)	ex-caster	Give a Smile until One Last Breath	Kodansha, Ltd.
9. Mikiko OTONASHI Kunio MURAI (2004)	actress (husband)	My Wife's Breasts 16 Years for Two of Us Who Lived with "Breast Cancer"	Kobunsha, Co., Ltd.
10. Eri HIRAMASTU (2004)	singer	My Room, a Dress Shirt, And "My Truth"	Shueisha Inc.
11. Kazuko HAMANAKA (2004)	patient advocacy group leader	Holding a Hope in My Mind	Gariver Products, Co., Ltd.
12. Michiyo YOKOUCHI (2005)	singer, dancer	Letters to the Child from Mother with Cancer, Forever	Sony Magazines, Inc.
13. Takako WAT (2006)	patient advocacy group leader	Treasure Box of Love and Courage	Doyukan, Inc.
14. Tsuneko OGURA (2006)	doctor	Wil-Before You Sleep, A Cassette Tape of Love Dedicated to My Son from a Woman Doctor Who Got Cancer	Bookmansha*
15. Yuko EMON (2006)	actress	Emon Yuko's Diary of Cancer and Slow Life	The Asahi Shimbun, Co.
16. Atsuko MIYAZAKI (2006)	nurse	Dying As We live	Shinpusha*
17. Mayumi HONDA (2008)	journalist	I Can't Believe That a 34-Year-Old Person Gets Cancer	Evidence-sya Inc.
18. Rika YAMAUCHI (2008)	nurse	A Nurse Barely Living	Asukashinsha Publishing
19. Tsuneko OGURA (2009)	doctor	Words from a Woman Doctor with Breast Cancer, A Positive Prescription for Those Who Experience Relapse	Shufunotomo, Co., Ltd.
20. Makiko SATO (2010)	freelance writer	Living with Breast Cancer After Menopause	Chuokoron Shinsha, Inc.
21. Yoko SANO (2011)	children's picture book writer	I fully Intend to Die	Kobunsha, Co., Ltd.
22. Kaoru ANDO (2011)	doctor	When a Woman Doctor Gets Breast Cancer	Metamor Publishing, Co., LTD.

*As the publisher has no English name, we spelled the name based on the sound of Japanese letters.

4.1. 'Gratitude toward Others'

This category is generated from four sub-categories and describes situations related to overflowing feelings of gratitude and deepening relationships with closely related persons, family and patients with the same disease. The sub-category <Happiness in deepened family ties> includes codes identified by [I realized my family's kindness after developing cancer], which shows awareness of members of the family who accepted the patient, and [I noticed myself as needed by my family] which expresses that the experience of family relationships had deepened and that there were feelings of satisfaction with time spent with the family. <Presence of a partner that became more important to me> expresses an

Table 2. Positive changes due to cancer experience.

Category	Sub-category	Representative Code
Gratitude toward others	Happiness in deepened family ties	I came to enjoy the time spent with my family.
		I felt gratitude to my family.
		I found I can relax best in the family.
	Presence of a partner that became more important to me	I noted another side of my partner's personality.
		I noticed that the load weighing me down has been lighter when I am with my husband.
	Realization of and gratitude toward people who accept me	I came to understand the feelings of others after developing cancer.
		I noticed there are people who listen to me after developing cancer.
		I noticed myself regenerated by consideration of others.
Benefits due to the cancer	Importance of words spoken by those with the same experience	I realized that words spoken by those with the same experience are encouraging.
	Activities to be engaged in after a cancer diagnosis	I enjoy hobbies I prepared for in order not to be discouraged.
	What I think was lucky	I decided to think that I was able to quit smoking as a reward for the amputation of the breast(s).
		I thought that I was lucky to have a right to sit in priority seats (in public transport) thanks to the cancer.
Happiness at living a normal life	Pleasure in doing things that are taken for granted	I was grateful that I could live to welcome the New Year.
		I appreciated that I could perform daily activities.
	A feeling of peace recognized through experiencing pain	I felt happy to do daily activities by myself.
		I felt the joy of life without physical pain.
Realization of and satisfaction with my growth	My growth achieved through the cancer experience	After the cancer experience, I became able to see a lot of things that had been invisible before.
		I learned the philosophy to be able to change something unfavorable to favorable.
		I felt my own growth through experiencing cancer.
	Pleasure in re-recognizing my own skills	I was pleased to recognize my skills.
Awareness of the meaning of my existence	Awareness of the meaning of my existence	I became aware of my own existence after developing cancer.
		I began to regard myself positively through experiencing cancer.
	Importance of life recognized through experiencing cancer	Thanks to cancer, I became able to notice what was impossible before.
		I needed to face obstacles to learn about life.
		I want to cherish my valuable experience of breast cancer.
Hopes for life	Willingness to make the most of life`	What made me positive is holding on to life rather than acceptance of death.
		Although we cannot change our innate fate, we can change destiny by ourselves.
		I wish to treasure my limited time to the full.
	Time given by cancer to start life again	I thought that I was given time to face my death.
		I learned to think the cancer was not entirely bad because I can prepare for it to the last moment.
		I want to cherish every moment of my life while preparing for death.
	Appreciation for experiencing cancer in the present age	I appreciate that I developed the cancer today when better treatment is available.
	Awareness of living with cancer	The image of cancer has changed from death to living together.
Willingness to contribute to others	Cancer experience that impels me to take advantage of	I don't want anyone to experience breast cancer.
		I wish to support others as much as I can.
		I must have some mission because I am still alive although I was diagnosed as cancer.
	Improved understanding of the attitudes of healthcare providers toward patients	I became able to understand patients' feelings.
		I reconfirmed my policy to extend a supporting hand to patients as a nurse.

awareness and sense of ease when the patient is in the company of the family, specifically the husband. The patient realized or discovered kindness and new aspects of the relationship with the husband, as shown by the statement that *the person who follows me with the warmest heart is my husband, always staying with me*. Patients tried to create time that was spent where husband and wife were alone, something which usually becomes possible after retirement, and they became aware of this as a fulfilling time for the couple. This category also includes the awareness that the existence of the husband eases the psychological burden on patients. <Realization of and gratitude toward people who accept me> expresses the awareness that the patient feels supported by people other than family, and the patients realized they became more considerate of the feelings of others after developing cancer.

[Kind support from others is an unexpected gift arising from gratitude] expresses that patients were aware of feelings of gratitude towards consideration shown by others, and discovered that support from others have an effect on both parties (the patient and others). <Importance of words spoken by those with the same experience> expresses that the words help alleviate mutual feelings of distress which is possible only because both have experienced the same kind of cancer.

4.2. 'Benefits Due to the Cancer'

This category is generated from two sub-categories which describe the experience where patients felt "benefits" clearly in their daily life due to the disease, cancer. <Activities to be engaged in after a cancer diagnosis> includes cases where hobbies patients had thought about for themselves, considering the present and future health conditions, now became enjoyable activities in daily life and not only for coping with cancer. <What I think was lucky> includes situations such as that [I decided to think that I was able to quit smoking as a reward for the amputation of the breast(s)]. This code also represents the thought that this (the diagnosis) had a better effect than had been expected, implying "a bonus unexpectedly earned" (former ideas) and "an active effort to decide to regard something previously unfavorable as a reward" (latter).

4.3. 'Happiness at Living a Normal Life'

This category generated from the two sub-categories describes an awareness that patients recognize the value of things and matters in daily life that are taken for granted and which they had not noticed before developing cancer. <Pleasure in doing things that are taken for granted> expresses situations where patients feel happy to see annual events such as the new year and birthdays, recognizing that being able to be a part of all of such daily activities as a source of joy and happiness. <A feeling of peace recognized through experiencing pain> depicts situations where patients have noticed how happy and carefree life without physical pain was through experiencing the physical pain due to cancer, things they had taken for granted before experiencing cancer.

4.4. 'Realization of and Satisfaction with My Growth'

This category is generated from two sub-categories describing situations where patients became aware that they had the ability to cope with cancer and overcome hardships. <My growth achieved through the cancer experience> describes situations where patients became aware that their perspective had changed through the experience of cancer, and realized that they themselves were able to develop despite the cancer and felt appreciation for the change. <Pleasure in re-recognizing my own skills> occurs when patients recognized that they themselves have developed skills after making efforts to cope with the distress due to cancer. As shown by the code [I would not have been able to make such efforts if I had not had this negative experience], patients recognized that pain and distress due to cancer had drawn out and helped develop their abilities.

4.5. 'Awareness of the Meaning of My Existence'

This category describes the positive awareness displayed by patients in relation to their existence. This awareness comes from many different experiences that the patients had, such as noticing something new and feeling happy. As this category is generated from one sub-category, we assigned the same name to both the category and the sub-category. The following statements represent this situation: *I sometimes feel the meaning of my existence, thinking that suffering from cancer was not just a waste when I listened to the problems of someone else and the person thanked me*, and I feel that I have come to appreciate myself more than before I developed cancer.

4.6. 'Hopes for Life'

This category is generated from five sub-categories and describes an awareness of the meaning of being alive and the thought that I have to make the best effort to the last minute. <Importance of life recognized through experiencing cancer> expresses situations where patients realized the significance of their life more deeply, knowing the profound meaning of life as described by [I realized the joy of living] even through the cancer that makes patients think about death and brings much distress. <Willingness to make the most of life> is the situations where patients try to concentrate energy on the time they are alive with an awareness that the time they have left is limited. <Time given by cancer to start life again> expresses the awareness that patients had second thoughts on how to live until the moment of death, and tried to complete their lives in a satisfactory manner, as described by [I want to cherish every moment of my life while preparing for death]. <Appreciation for experiencing cancer in the present age> shows gratitude at being able to live positively with hope because the development of cancer treatment makes physical pain less severe than it used to be. <Awareness of living with cancer> shows that patients changed their ideas about cancer, regarding it as a partner to live together with rather than an enemy to fight.

4.7. 'Willingness to Contribute to Others'

This category is generated from two sub-categories and describes the inclination that patients want to assist and contribute to the lives of others by making use of the cancer experience. <Cancer experience that impels me to take advantage of> expresses the sense of mission of what the patients would like to or feel a need to (an urge to) make use of their experience of cancer to assist others who suffer from the same distress. <Improved understanding of the attitudes of healthcare providers toward patients> expresses the decision of the authors of the report here who are healthcare providers to make use of their experience with cancer patients in providing care.

5. Discussion

Like the authors of the breast cancer journals written by patients (Journals) analyzed in this study, it can be inferred that many women who undergo amputation of the breast(s) are subject to severe psychological trauma as they notice their change in appearance and feel lost and imperfect as humans. The published journals may be an expression showing that the authors who experienced to live with the disease while facing and suffering from this condition desired to contribute a record of their experience to society. This section examines benefit finding (BF) as extracted from the journals by category, and finally provides a discussion of BF.

5.1. 'Gratitude toward Others'

Examining the matters of the codes in Table 2, two types of awareness appear in relation to family, husband, and other close persons, and these can also be observed in all of the four sub-categories. One type is an awareness of the relationship patients had before developing cancer, and the patients became better aware of the meaning and value of the relationships after developing cancer. The other is the awareness of a strengthening of relationships and changes triggered by being diagnosed with cancer, and an awareness of new relationships with previously unknown people. Here, the relationships involve changes in or improvements of the quality. In either case, patients became aware of their own role in the relationship, and realized that they are supported by the relationships and appreciate the relationships.

After the amputation of the breast(s), changes in appearance as well as functional disorders occur, and patients are subject to these physical changes feeling that they have been deprived of a feminine trait. This experience may cause a crisis in or loss of self-image. In this case patients become aware that they are supported and needed by the family, and they come to feel they can be themselves in their family. These discoveries may remind them of the value that they have in themselves. It can be inferred that support by the husband makes them realize that they are wives and females even though they have had their breasts removed, giving them a secure and strong sense of safety and pleasure. Therefore, it is suggested that becoming aware of <Other sides of the partner's perso-

nality> is a discovery in the relationship of the couple, and the relationship becomes deeper and stronger. The pleasure obtained when patients realize that they have remained the same and are still playing their roles in the family, and that their ways are not inferior to what it was before losing their breast(s) would be a significant factor to improve their resilience as patients with breast cancer. Although there is a similar awareness in the relations to friends and close persons other than family, patients experience new facets in relationships. It can be inferred that they may have many opportunities to feel thankful for support provided by the people surrounding them in writing and publishing the breast cancer journals.

People who have experienced breast cancer confirm and revaluate themselves in terms of triple-structured relationships with husband, family, and other close persons. They may reconstruct their identity, something which has nearly entirely been taken away from them, in the three kinds of relationships after experiencing the disease, cancer, and surgery, having maybe felt as if their identity had been lost. We think that this pleasure and appreciation as regaining an identity once almost lost is the central concept of this category.

5.2. 'Benefits Due to the Cancer'

The sub-category, <What I think was lucky> includes humorous expressions such as regarding the success in quitting smoking as a "reward" for the amputation of the breast(s), and a comment such as that [I thought that I was lucky to have a right to sit in priority seats (in public transport) thanks to the cancer]. These expressions could show the intention the authors try to think of their hardships as BF through different perspectives as well as by their own trying to do the best to survive.

Humor is defined as something people need by nature, and something they cannot live without [11]. Frankl has stated that "It is well known that humour, more than anything else in the human make-up, can afford an aloofness and an ability to rise above any situation, even if only for a few seconds" ([12], p. 35). We think humor can create an "objectivity" to look out over all of life and ourselves even in serious situations. It is not clear whether the authors developed the scope to become objective while writing the journals or the objective perspective was acquired through the help of humor in fighting against cancer. However, assuming that people who experienced breast cancer have a sense of humor would be a key to understand their psychological condition. Johnson analyzed the narratives of women with breast cancer and reported that humor is a significant coping strategy [13]. This leads us to believe that humor is a viewpoint that deserves more attention in the development of nursing sciences.

5.3. 'Happiness at Living a Normal Life'

The sub-category, <Pleasure in doing things that are taken for granted> includes cultural, practical, and spiritual aspects rooted in Japanese traditional life-styles, such as "welcoming the new year", where patients appreciate the day-to-day

routines they have lived with before developing cancer. Culture is defined as sense of value and belief that is learned and passed down [14], and people have lived in the culture by learning many things since we were born. Culture links the individual person and society firmly. The experience to notice that we can be in the same culture as before seems to help us confirm our feeling of comfort, leading to a sense of relief and convincing each of us that even now I am good enough really. Therefore, "what is taken for granted" can be assumed to be an extremely valuable awareness for people experiencing breast cancer.

5.4. 'Realization of and Satisfaction with My Growth'

This category describes how patients realize that they have developed based on the cancer experience and how strong they have become overcoming the distress of cancer. As the codes in Table 2, patients became aware that they developed as persons because they have overcome the hardships of cancer, and have even shown appreciation for the cancer experience.

Post Traumatic Growth (PTG) is defined as the "experience of development as a person growing out of pain and mental struggles due to a very adverse condition" [15]. 'Realization of and satisfaction with my growth', one BF identified by the analysis in this study is the awareness that patients were able to develop themselves by their own ability to overcome the distress of or by overcoming the hardships of cancer. This is very similar to PTG, and we will examine the correlation between PTG and BF that results in benefits in future studies.

5.5. 'Awareness of the Meaning of My Existence'

The statement that *I sometimes feel the meaning of my existence, thinking that suffering from cancer was not just a waste when I listened to the problems of someone else and the person thanked me* implies that patients questioned themselves about the reason for their existence after developing cancer. It is natural that experience of a sense of loss due to the disease and surgery makes a gap between the ideal self before experiencing cancer and actual self now, and there will be gaps and shifts in self-cognition. Endo suggests that such gaps will bring individuals into emotional conflict [16]. Many people who experience breast cancer may suffer different kinds of conflict. However, realizing that they are of help to others and understanding that their experience will be empowering is important for them to reconsider themselves positively and reconstruct an ideal self.

5.6. 'Hopes for Life'

The four sub-categories that generated this category depict process from where patients became aware of death till they determined how they wished to live till death intrudes. All the codes extracted in this study describe situations where patients question themselves as to what they can do and how they want to live to the very last moment considering the time left, facing these obstacles in conjunction with the awareness of cancer, and in the unavoidable fear of death. We in-

terpret 'Hopes for life' as BF to strive towards self-realization, powerfully after suffering anguish with fear of death. This BF may be unique in that it is generated when patients are forced to realize that they suffer from a disease that it is difficult to be cured from like a cancer is and that there is only a limited time left before death.

5.7. 'Willingness to Contribute to Others'

This category can be interpreted as a BF that comes from awareness of social roles which patients can play only because they have experienced breast cancer or because it is a mission the patients feel a need to do. <Discovery of the significance of words of a person who has had a similar experience> included in 'Gratitude toward others' expresses that advice and words from persons who have experienced the same affliction with breast cancer was valuable. In case of a 'Willingness to contribute to others', it seems that patients who experienced breast cancer desire to use their experience to help others, contributing their experience to persons who are at a loss with the disease like they themselves used to be. It can also be interpreted as a genuine desire to help others to avoid suffering from the hardships they went through.

A study of BF among patients with collagen diseases in Japan has reported a characteristic that was expressed as "I was getting to desire to help others" [7], and a study of BF among patients with psychiatric disorders has identified a desire to help others, reporting "finding a new role in society" [17]. 'Willingness to contribute to others' can be a BF unique to the Japanese who experience diseases, because it has not been reported as a BF in studies from outside Japan as the two studies cited above pointed out. However, it is not probable that an awareness of contributing to others has not occurred because volunteer activities are actively conducted in Western culture. Future studies need to explore this difference comparing cultural areas.

As described above, this study examined each category separately, and found that the authors of the journals felt appreciation for "common practices", "living", and "others" and had hopes to make the most of life again, while pondering on themselves and the discontinuity in their lives. The findings also suggest that patients revaluate themselves and find meaning in their existence while developing an appreciation of others. Pain and distress due to diseases generate irregularities in daily lives and routines. Therefore, we think that patients are motivated by trying to find meaning in the adverse event, trying to understand the event intentionally, and alter their world view, and eventually BF is the result. This study cannot determine the process of trying to find meaning in the surveyed journals, because we focus on BF identified as a result of analysis. However, as patients who recognize BF due to diseases do revaluate and reconstruct themselves, it can be inferred that they improve in resilience by positively making efforts to find meaning in their experience.

Journals were written by authors who "wished to write", and included statements that express the desires of the authors, including the helping of others by

publishing their personal experience of breast cancer or by contributing their experience to the wider society. For this reason, extracting BF may have been relatively easy in this study. However, we believe that positive changes through the experience of cancer do occur. As a study has reported that patients will be better adapted to life with cancer five to eight years later if they achieve BF in the year they were diagnosed with breast cancer [18], it is necessary for healthcare providers to pay attention to BF at the early stages of the diagnosis. The present study does not clearly establish whether all patients with breast cancer experience positive changes in their lives. To understand the various and complicated total pain experienced by breast cancer patients is important and meaningful and we, nurses, should not interact with patients on the assumption that they will obtain BF. However, breast cancer patients have the potential to survive while struggling with the disease by obtaining BF under specific conditions. We are well aware that it is necessary to examine these conditions in future studies, and believe that BF due to a disease is a worthwhile subject that needs to be addressed further as a key element for patients with cancer thinking about how to survive.

6. Conclusion

This study analyzed the contents of 22 breast cancer journals written by patients focusing on positive changes, and seven categories were identified. The findings suggest that these seven positive changes were self-revaluation made in the process of living after the patients underwent surgery, by trying to find the meanings of each event in daily life while relating the occurrences to the social context or the context of illness trajectory.

Acknowledgements

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Pressure Ulcers in Institutionalized Elderly People: Association of Sociodemographic and Clinical Characteristics and Risk Factors

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Abstract

Objective: To evaluate the association of socio-demographic and clinical characteristics, and risk factors with occurrence of pressure ulcers in institutionalized elderly people. **Method**: This cross-sectional, analytical study, in quantitative approach, performed from the database analysis linked to the project "Pressure Ulcer in institutionalized elderly people: Association of incidence with the risk factors to functional and nutritional assessment" developed in six long-stay institutions for the elderly people in João Pessoa. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. Associations were made through chi square test and Odds Ratio. **Results**: The clinical conditions of significant associations with the occurrence of pressure ulcers were the variables neurological disorders (p = 0.011) and visual impairment (p = 0.005). As for risk factors, the most important was fecal incontinence (p < 0.001), urinary incontinence (p < 0.001), cognitive impairment (p = 0.007) and physical limitation (p < 0.001). The chance for the occurrence of injury was nine times higher for elderly people with physical limitations and about three times higher among those who use diapers. **Conclusion**: The analysis of the associations pointed out problems that require intervention in order to prevent health implications of the elderly people and to minimize the risk and occurrence of this injury.

Keywords

Elderly People, Institutions for the Elderly People, Pressure Ulcer, Health

Profile, Risk Factors

1. Introduction

Population aging has attracted attention in the scientific community, as it represents the basis for reversing the Brazilian age pyramid. This transformation of the demographic profile implies increased demand for health services, social security sector and human resources to care for the elderly people.

With the natural aging process, there are several organic physiological, anatomical and functional changes, reflecting to the increase of chronic diseases, morbidity, and loss of functional, sensory, motor and metabolic capacity, taking the elderly person to a fragile condition. The situation of irreversible vulnerability promotes functional dependence of the individual, which becomes a cause for concern in family life.

However, it is the need for constant care that causes the search for institutionalization of elderly people for the absence of family, or abandonment, lack of financial resources or the imposition of the capitalist world that enslaves the time availability of the company, making it impossible to offer care [1].

This scenario contributes to increase in demand for places in Long Term Care Institutions (LTCI), formerly asylums. These constitute governmental or nongovernmental institutions are responsible for the care of dependent or independent elderly person [2] [3].

When considering the specific conditions of the elderly person, it is the LTCI which provides quality assistance to long-lived population, in order to provide maintenance and restoration of health and quality of life. Therefore, considering the decline in biological functions inherent to the aging process, the accesses to care by a qualified multidisciplinary team to work in gerontology have been shown as essential for the promotion of health and well-being of institutionalized elderly people [4] [5].

Although the ideal profile requires the presence of a multidisciplinary team in LTCI [6], experiences in these scenarios point to a reality in which health care is provided by nursing professionals in a very small number and elderly caregivers who are often without the required professional training, compromising the best directed care.

About the vulnerability of the elderly people to morbidities, studies cite the appearance of pressure ulcers (PU) as a cause of recurrent loss of health and as difficult injury control in institutionalized elderly population [7] [8]. Its development involves extrinsic and intrinsic factors, while physical mobility, decreased sensory perception and the elderly population are seen as important determinants of their appearance [9] [10].

There are guidelines for the prevention of PU, which is based on the knowledge and application of relatively simple steps and can be used universally. However, it demands time and attention [11].

Meanwhile, the longevity process, vulnerability to morbidity and the emergence of PU are conjugated as factors that hinder the healthy aging and wellbeing may result in worsening of the bio-psychosocial framework of this population, in view of the complex situation generated by institutionalization.

Thus, it is aimed to analyze the association of socio-demographic and clinical characteristics, risk factors and the occurrence of pressure ulcers in institutionalized elderly population.

2. Method

It is a cross-sectional and analytical study with a quantitative approach, performed from the database analysis linked to the project "Pressure Ulcer in institutionalized elderly people: Association of incidence with the risk factors to functional and nutritional assessment" developed in six long-stay institutions for the elderly in João Pessoa, registered in the Elderly Population Council of Paraiba, Brazil.

For database all 324 elderly participants of the survey were selected, residents in the period from January to December 2013. Physical examination was carried out of the participants, followed by interview and direct observation of the health condition of the elderly person, and the use of the chart as a secondary source. The risk and the presence of pressure ulcers were evaluated by examining the skin of older people.

For the selection of the subjects, we used as inclusion criteria the elderly people who are 60 years-old or more, residing in the institution, agreeing to participate in the study (those who did not have the physical and/or cognitive conditions to consent to their participation, this was provided by their responsible). As exclusion criteria we consider the elderly who, after interview, died or were absent from the institution due to hospitalization.

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. It was initially performed an exploratory analysis of data for characterization of the research subjects using descriptive statistics related to the variables considered in the study. Socio-demographic variables and clinical conditions were associated with the event of interest (pressure ulcers), using the chi square and odds ratio tests with Confidence level of 95%, margin of error related to the considered estimate of 5%.

The Ethics Committee of the Federal University of Paraíba UFPB under Protocol 0468/12 and CAAE, approved the study: 02043712.4.0000.5188. In accordance with the ethical principles of Resolution CNS 466/12 [12], after being informed about the research objectives and voluntary participation, all elders signed (or left the digital brand) the Consent and Informed.

3. Results

The statistical analysis of the socio-demographic data showed that from the 324 elderly patients, 75.3% (244) are the female and 24.7% (80) are male. In relation to age, the minimum was 60 and the maximum of 109 years-old, the average age

among the elderly people is 81.17-year-old (±9.38). As to education, 54.0% (175) are illiterate or literate, followed by 23.5% (76) from the elderly people who completed elementary or incomplete primary education, 51.9% (168) are single, 45.7% (148) do not have children and 23.6% (76) had 1or 2 children (Table 1).

Table 1. Socio-demographic profile of the elderly people who live in ILPIs. João Pessoa, PB, Brazil, in 2013.

Socio-Demographic Variables	N	%
Age group		
60 -70	36	11.1
70 - 80	100	30.9
80 - 90	128	39.5
90 - 100	51	15.7
≥100	9	2.8
Sex		
Male	80	24.7
Female	244	75.3
Education		
Illiterate or literate	175	54.0
Complete/incomplete primary/elementary education	76	23.5
Complete/incomplete high school	33	10.2
College	18	5.6
NS/NR	22	6.8
Marital status		
Single	168	51.9
Married	23	7.1
Widower	93	28.7
Others[1]	40	12.3
Children		
No one	148	45.7
1 - 2	76	23.6
3 - 4	31	9.5
>5	23	7.0
NS/NR	46	14.2
Time of institutionalization		
<5 years	192	59.3
5 - 10 years	85	26.2
≥10 years	47	14.5
Income		
Retirement	289	89.2
Pension	14	4.3
Others[2]	21	6.5
Total	324	100

[1]It refers to stable union, divorced, separated and do not know/ did not answer. [2]It refers to donation, others and do not know/did not answer.

As for institutionalization time, 59.3% (192) have been in the institution for less than 5 years and 89.2% (289) had a monthly income from retirement (Table 1).

In Table 2 we can see that there was not statistically significant association of socio-demographic variables and the related variable to the occurrence of ulcers, as shown by the p-values associated with the respective tests (chi square), odds ratio (odds ratio) and confidence interval (IC).

The analysis of the clinical conditions and the development of pressure ulcers among the institutionalized elderly people, revealed a statistically significant association between the independent variables, neurological disease and change in vision, such as the occurrence of the injury. This association can be seen from the results in Table 3.

Among the risk factors for pressure ulcers, the variables urinary and fecal incontinence, cognitive impairment and physical limitations were significantly associated with the occurrence of PU, with p-value < 0.05 (Table 4).

Table 2. Associations of socio-demographic variables with the occurrence of pressure ulcers (PU) in institutionalized elderly people—Joao Pessoa, PB, Brazil, in 2013.

Variable	p-value	Odds ratio	IC
Sex	0.783	0.881	0.356 - 2.179
Age	0.744	0.874	0.388 - 1.965
Education	0.202	0.395	0.090 - 1.729
Marital Status	0.962	1.038	0.231 - 4.669
Family Income	0.881	0.774	0.094 - 6.371
Time of institutionalization	0.105	0.444	0.163 - 1.212

*Statistically significant association p ≤ 0.05 (chi square). CI = confidence interval for odds ratio.

Table 3. Association between clinical conditions and the occurrence of pressure ulcers (PU) among institutionalized elderly population—Joao Pessoa, PB, Brazil, in 2013.

Variables	p-value	Odds ratio	IC
Osteoarticular diseases	0.205	1.756	0.788 - 4.231
Cancer	0.369	0.917	0.888 - 0.948
Diabetes	0.576	1.295	0.522 - 3.213
Stroke	0.230	1.743	0.697 - 4.359
Heart disease	0.388	0.418	0.054 - 3.215
Peripheral Vascular Disease	0.361	1.807	0.499 - 6.536
Neurological Disease	0.011*	3.044	1.242 - 7.457
Hypertension	1.000	1.000	0.449 - 2.229
Obesity or thinness	0.157	3.021	0.607 - 15.029
Paralysis	0.207	2.676	0.547 - 13.092
Change in vision	0.005*	0.095	0.013 - 0.715
Change in audition	0.505	0.606	0.138 - 2.675
Respiratory diseases	0.737	1.296	0.284 - 5.922

*Statistically significant association p ≤ 0.05 (chi square). CI = confidence interval for odds ratio.

Table 4. Association between risk factors and the occurrence of pressure ulcers (PU) among institutionalized elderly population—Joao Pessoa, PB, Brazil, in 2013.

Variables	p-value	Odds ratio	IC
Smoking	0.908	1.060	0.391 - 2.877
Alcohol consumption	0.571	1.371	0.459 - 4.097
Edema	0.443	1.492	0.533 - 4.178
Cleanse the skin	0.550	0.918	0.888 - 0.949
Fractures	0.744	0.844	0.304 - 2.344
Fecal incontinence	<0.001*	8.316	3.046 - 22.707
Urinary incontinence	<0.001*	14.884	3.456 - 64.134
Diaper use	0.364	2.765	3.943 - 10.521
Cognitive deficit	0.007*	3.672	1.349 - 9.996
Physical limitation	<0.001*	9.805	2.276 - 42.238

*Statistically significant association p < 0.05 (chi-square). CI = confidence interval for odds ratio.

4. Discussion

In this study, it is possible to observe the profile of the resident population in long-term institutions in the municipality of João Pessoa (Table 1).There was not any socio-demographic variable that showed a statistically significant association with the occurrence of PU. All Odds ratio values were below 1, except for marital status, which showed slightly higher (1.038), indicating that the socio-demographic variables do not affect the chance of institutionalized elderly subjects for presenting pressure ulcers (Table 2).

However, the results of research carried out in three cities in Brazil evidenced by logistic regression analysis (r = 0.311) that the female was predictive of the prevalence of PU in elderly people of LTCI [13]. This reveals that the demands and local conditions may influence differently the risk of injuries.

Despite the variety of studies about PU in the world, they focus their attention mainly in hospital environment [14] [15] [16]. In this scenario, a study of prospective cohort of 534 patients in large hospital in Brisbane, Australia, has identified older age as a factor associated with the development of PU [17]. It should be emphasized that advancing age contributes to the emergence of diseases and worsening health conditions, giving rise to hospitalization.

More recently, researches for elderly people have been conducted in LTCI, analyzing, among other things, the association of socio-demographic characteristics to the development of PU [7] [18]. At this juncture, a study of prevalence of cross-sectional, conducted with 365 institutionalized elderly people in São Paulo, found that there were not significant differences in demographic and clinical characteristics of elderly patients with pressure ulcers for each month of data collection [18].

In LTCI, among the institutionalized elderly patients, there are different clinical conditions, those who remain with their independence for self-care, and those who are partially dependent, or require someone to perform some activity,

dependent and bedridden. These different general health conditions are not committed to the point of determining hospitalization, which may explain the fact that age is not a factor associated with the development of PU because parallel there is moderate impairment or serious of much of the health status of elderly patients surveyed.

In Table 3, it is observed that the clinical conditions that showed statistically significant associations with the occurrence of pressure ulcers were the variables neurological disorders (p = 0.011) and visual impairment (p = 0.005). About the odds ratio, the value of odds ratio was 3044 to neurological disease. This means that elderly patients who are residents in LTCI with this type of clinical impairment don't have chance to present PU three times higher than those without neurological disease. The confidence interval for this variable showed minimum value above 1, confirming the significance and the chance of this group in presenting PU (Table 3).

It is known that neurological disease predisposes to increased length of stay in bed. The data corroborate similar research in which there was a significant association between neurological disease and PU [8]. According to the findings, studies that tested strategies for reduction of PU in hospital say that people with neurological injuries or alterations have great chance to present such chronic wounds [19] [20]. Thus, these findings support the evidence for relationship between neurological and emergence of PU.

Although the variable vision changes have presented significant (p = 0.05), the odds ratio was 0.095 *i.e.*, it is considered as a protective factor in this study population. It is believed that institutionalized elderly patients associated with this clinical impairment need special care professionals and caregivers due to loss of autonomy in performing daily tasks. It is understood that the preventive measures are intensified reducing the chance of involvement of the injury.

It is noteworthy that although there was not significant association between obesity or thinness with PU, the odds ratio (OR = 3.021) provided evidence that the elders in these clinical conditions have three times more likely to develop the injury, compared to those with normal weight. In this line of reasoning, it can be said that the data provided evidence that the high weight increases the pressure on the contact surface, whereas low weight exacerbates the pressure on bony prominences. So, both of them can negatively influence blood flow in the skin compression areas, causing PU.

In addition, poor nutritional status constitutes a risk factor for the advent of the PU, due to the reduction of oxygen, which reduces tissue tolerance to pressure. The PU progress rapidly and are more resistant to treatment in patients with nutritional disorders, complicating the healing process and increasing the susceptibility to complications. In people with malnutrition, specific therapy for the treatment of pressure ulcers is precisely indicated by the difficulty of production of fibroblasts, neoangiogenesis and collagen synthesis, and less tissue restoration capacity [21].

Meanwhile, clinical evaluation is initially recommended in order to examine

changes in body composition, poor dietary intake, changes the organism by functional modification as well as the use of therapies composed by immunemodulators and higher protein content of nutrients to accelerate the process of healing the lesion [22] [23].

Another risk factor associated with the PU is the prolonged stay in the same position [24]. Study found that individuals with higher amounts of fat have more chance of initial protection against PU, compared to those with less fat, although both develop injury when are not mobilized properly. Therefore, the reduced fat may facilitate the occurrence of the wound more quickly [25].

Thus, it is understood that in the aging process the adipose tissue and body mass due to the nutritional status to vulnerability to PU, especially among the elderly who is bedridden due to bed rest, pressure on bony prominences and other associated medical conditions.

In addition to therapeutic products, the literature states that the most interesting strategies for PU prevention are directed to postural change or change of placement, special mattress or use pillows to ease the pressure and education to patients and caregivers. These alternatives together reduce greatly the tissue damage and increases survival [25] [26].

With regard to risk factors, fecal incontinence (p < 0.001), urinary incontinence (p < 0.001), cognitive impairment (p = 0.007) and physical limitation (p < 0.001) showed statistically significant associations for the occurrence of PU. It was also showed that elderly people with physical limitations have odds ratio nine times greater for the occurrence of PU (OR = 9.805), with confidence interval (CI) between 2.276 to 42.238, compared to those with preserved mobility.

Cognitive impairment and physical limitations are conditions that enhance the patient's exposure to moisture, by urine, sweat or feces, accelerating the process of appearance of the lesion. Excessive moisture influences the change of the skin resistance generating serious consequences to elders' health, predisposing maceration and friction, making it easily susceptible to risk of developing UP [10]. In addition to the impact on the integrity of the skin, loss of bladder and bowel control can result in embarrassment and consequent social isolation.

It is necessary to point out that the municipality where the research has been developed has hot climate feature. In addition, the institutions do not have sufficient financial resources to acquire fans and cooled air, devices that reduce the production of sweat and promote comfort for the elders. In this sense, the environment becomes favoring moisture and change in the skin, being indicated for use as protective barrier creams and achieving proper hygiene [27].

Some risk factors such as smoking, alcohol consumption, skin cleansing and the use of diapers were evaluated in order to verify association with the occurrence of PU. However, none of them showed a statistically significant association, although it appeared interesting result for odds ratio (odds ratio) related to the use of diapers (2765). This means that the institutionalized elderly people in diaper use have almost three times higher chance for occurrence of PU when compared to those who do not use.

It is known that the lack of autonomy and dependence of this clientele requires from professionals the need for daily care, which requires specific knowledge and techniques in order to contribute to minimizing the risks to this grievance. Still, there are few studies of the long-term institutions that portray the practice of daily actions as preventive measures.

Recent data show that the PU reduction in US hospitals is related to the implementation of evidence-based practices. Among the aforementioned factors, the availability of specialized nurses in PU and care protocols was priorities for injury prevention [28]. Thus, routines and behaviors outlined for the specific care of pressure ulcers should be encouraged, especially among professionals who work in LTCI due to considerable occurrence of these injuries.

This study highlights the individual clinical characteristics of the elderly people, which are factors that act synergistically and predispose to the development of the lesion. Therefore, there is a need for professionals and caregivers to assure the quality of assistance in the prevention of pressure ulcers.

For this, just as there is an urgent need to develop care protocols, it is also important to use Scales as an instrument to facilitate the identification of risks to the development of the lesion. In addition, skin inspection and the application of protective devices for pressure relief at sites of bone prominence represent practices that will allow early detection of risk and prevention of injury.

So, despite the work overload in LTCI, nursing should pay attention to risk reduction and prevention of PU in institutionalized elderly patients, especially when they are flagged factors such as neurological problems, use of the presence of wheelchairs or bedridden, malnutrition and related clinical manifestations the occurrence of injury.

Thus, the elderly people inserted in this context require that professionals of all levels of knowledge seek intervention measures, with a view to changing attitudes related to the management of technical and essential therapeutic approaches to improve the quality of life and reduce the onerous costs demanded to health, since the institutions are philanthropic and lack of wealthy financial resources.

5. Conclusions

In this study, there was not statistically significant association between socio-demographic characteristics and the occurrence of PU. However, significant results were found for the variables neurological disease, abnormal vision, urinary incontinence, fecal incontinence, cognitive impairment and physical limitations. Moreover, the odds ratio for the occurrence of the injury was nine times higher for elders with physical limitations and about three times higher among those who use diapers.

Analysis of associations of risk factors observed in this study demonstrates the importance of the study, since relented to the scenarios studied problems that require intervention to prevent health implications of the elders and minimize the risk and occurrence of PU. In this sense, it is necessary for institutions to

provide quantitative adequate professionals to meet the demand of the local, as well as the participation of nurses, nursing technicians and caregivers in training to promote strategies and quality management in this service

Additionally, it reflects on the need to implement service and systematized record of protocols, which is aimed at preventing and or decreasing this complication, promoting the independence and autonomy of the elders for longer.

However, we see the need to meet various realities, whether hospital, outpatient or home, for the nursing practice has scientific basis. So, it emphasizes the convenience of publications whose study locus is LTCI so that the procedures developed by nurses are more specific and resolute

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Effects of Tube Depth and Infusion Rate of Continuous Humidification by Endotracheal Intubation on Humidification Effect

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Abstract

Objective: To investigate the continuous humidification tube insertion depth of endotracheal intubation and the flow rate of the wetting effect. **Methods**: From October 2008 to May 2010, among 132 patients of oral and maxillofacial surgery with tracheal intubation, continuous infusion can be adjusted to the wet method; according to the wet pipe, insertion depth of the flow rate is divided into four groups, by four different depths and velocities of the wetting effect, to be analyzed. **Results:** B group was significantly lower than other groups satisfied with indicators of four significantly different effects of humidification. **Conclusion:** When continuous humidification tube insertion depth of endotracheal intubation is 10 - 12 cm, and flow rate is 15 - 20 ml/h, the wetting effect will achieve greater satisfaction.

Keywords

Intubation, Continuous Humidification, Tube Depth, Infusion Rate, Humidification Effect

1. Introduction

Due to the characteristic surgical site and postoperative bleeding, endotracheal tube is placed into many patients after oral maxillofacial surgery [1]. However, after endotracheal intubation, the upper respiratory tract loses its heating and humidifying effects on the inhaled air. As a result, the humidified dry air directly enters the lower respiratory tract, forming sputum scab in the endotracheal tube or the upper respiratory tract, thereby leading to airway blockage, if the humidification of airway is not sufficiently performed in clinical nursing [2]. Therefore, reasonable and effective airway humidification is especially important to patients with endotracheal intubation. After implementing various kinds of humidifica-

tion methods, such as wet gauze covering, intratracheal infusion, ultrasonic aerosol inhalation, artificial nose, and continuous infusion airway humidification, continuous infusion airway humidification controlled by adjustable infusion has been adopted since 2008 [3]. Compared with the conventional one, this method can infuse the humidification liquid into the respiratory tract in a stable, constant, slow and continuous way, so as to achieve effective humidification. However, in clinical practice, it is found that the insertion depth into the endotracheal tube and the infusion rate of the humidifying tube directly affect the humidification effect, but there is no uniform standard in the relevant literature. In particular, some reports recommended a tube depth of about 15 - 18 cm and an infusion rate of about 8 - 10 ml/h. For this purpose, this paper investigated the specific tube depth and infusion rate that enabled the optimal humidification effect through clinical observation.

2. Objects and Methods

2.1. Objects

One hundred and thirty-two patients were selected from October 2008 to May 2010 to undergo endotracheal intubation in our department. There were 87 males and 46 females, aged 14 - 76 years old, with an average of 43 years old. All of them were patients who underwent endotracheal intubation after oral maxillofacial surgeries, including 37 orthognathic surgeries, 28 mandibular fracture reduction surgeries, 51 surgeries for benign and malignant tumors, and 16 cases of uvulopalatopharyngoplasty (Table 1). Their conditions were stable after surgery, and all of them were conscious adult patients with cough reflex. Low-flow oxygen was given without using the ventilator, with an average intubation time of 15 - 20 hours, a length of endotracheal tube of 30 ± 2 cm, and a lumen diameter of 7 - 8 mm.

2.2. Methods

One hundred and thirty-two patients were randomly divided into 4 groups according to the sequence of surgery, with 33 patients in each group. The flexible hose for removing the scalp vein catheter of the adjustable infusion set was inserted into the inner wall of the endotracheal tube. In Group A, tube depth was 10 - 12 cm, and infusion rate was 8 - 10 ml/h; in Group B, tube depth was 10 - 12 cm, and infusion rate was 15 - 20 ml/h; in Group C, tube depth was 15 - 18 cm, and infusion rate was 8 - 10 ml/h; in Group D, tube depth was 15 - 18 cm,

Table 1. Sociodemographic and clinical characteristics.

	Youngs	Middles	Olds	Total
TUMOR	1	3	7	11 (30%)
TRAUMA	2	1	0	3 (10%)
INFECTION	1	3	3	7 (20%)
DEFORMITY	3	2	1	6 (20%)

and infusion rate was 15 - 20 ml/h. We also found in past experience that when the humidification tube was fixed inside the endotracheal tube, sputum scab might be easily formed on the side not infiltrated by the humidification liquid due to limitations of the position. For this reason, an approach simultaneously fixing the humidification tube and the oxygen tube inside the intubation tube was adopted for each group, keeping the lower end of the humidification tube 1 - 2 cm below the lower end of the oxygen tube. Therefore, humidification liquid could be evenly distributed in the area to be humidified after being blown by oxygen, making the humidification effect more uniform.

2.3. Selection of Humidification Liquid

The humidification liquid was selected as 500 ml of sterile water for injection + 5 mg of dexamethasone + 100 mg of etimicin sulfate + 30 mg of mucosolvan.

3. Humidification Effect and Criteria

The humidification effect was determined according to the patient's subjective symptoms and the changes in some monitored indicators. The subjective symptoms include suffocation, choking and emotions, while the changes in monitored indicators include sputum viscosity, auscultation, and sputum attached to the wall of endotracheal tube. On this basis, the humidification effects were divided into two standards.

3.1. Satisfaction

Thin sputum can be smoothly sucked out or coughed up. No dry rales or a lot of wheezy phlegm can be auscultated in the trachea. The patient is quiet with smooth breathing. The removed endotracheal tube wall is clear and free of mucus.

3.2. Dissatisfaction

Sticky sputum is not easy to be sucked out. Dry rales can be auscultated in the trachea; too thin sputum that should be constantly drawn. A lot of wheezy phlegm can be auscultated in the trachea. The patient suffers frequent cough; unstable emotion, anxiety, and intolerance to the tube. The removed endotracheal tube wall is attached with sputum.

4. Results

The sputum properties, cough symptoms, emotional expression, and dissatisfaction rate of humidification effect, as well as the sputum attached to the removed endotracheal tube wall and its attachment site, are compared as shown in the table below. According to the table (Table 2), the dissatisfaction rate of Group B was significantly lower than the other groups; there was significant difference in the humidification effect between the four groups. It was concluded that, when the endotracheal intubation continuous humidification tube's depth was 10 - 12 cm and its infusion rate was 15 - 20 ml/h (Group B), the humidification effect

was more satisfying (Table 3).

5. Discussion

Airway humidification is particularly important for the maintenance of the normal function of the respiratory tract and the prevention of various complications. The humidification of artificial airway has been extensively reported in previous studies. At present, a variety of humidification methods are put into clinical use, with respective advantages and disadvantages [4]. In comparison, continuous airway humidification delivers a positive and clear effect. However, there is no uniform standard on how to choose the tube depth and infusion rate of endotracheal intubation continuous humidification tube, in order to achieve better humidification effect. This study was intended to analyze the results of four classified groups, in an attempt to prove some reference to the clinical work. In Groups A and C, for instance, most patients were found with viscous sputum. The reason for this was that the humidification liquid could not provide an effective humidification when passing through the wall, because of its low flow rate (8 - 10 ml/h), about 2 drops per minute, combined with airflow effects of breathing, coughing, and oxygen uptaking. As a result, a total of 15 cases of viscous sputum were found in the two groups, and the sputum attached to the removed endotracheal tube wall was mostly in the lower part of the intubation tube, indicating a too low flow that might be exhausted by physical actions before reaching the lower end of the endotracheal tube. In Group D, a lot of cases were found with too thin sputum and frequent cough, and the humidification tube's depth was 15 - 18 cm and infusion rate was 15 - 20 ml/h. Given the certain arc of the endotracheal tube making it impossible for the humidification

Table 2. Sputum properties, cough symptoms, emotional expression, and dissatisfaction rate of humidification effect in the four groups.

Groups	Viscous sputum	Thin sputum	Dry rales rate	Frequent cough	Anxiety	Dissatisfaction
Group A	9	0	3	1	2	45.4%
Group B	2	1	0	0	1	12.4%
Group C	6	0	1	2	2	33.6%
Group D	2	4	0	3	3	33.2%

Table 3. Sputum attached to the removed endotracheal tube wall and its attachment site in the four groups.

Groups	Middle wall	Lower wall	Total
Group A	3	8	11 (3%)
Group B	1	2	3 (9%)
Group C	2	5	7 (21%)
Group D	4	2	6 (18%)

tube to closely attach to the wall, the humidification droplets with relatively faster infusion rate might directly enter the trachea, irritating the respiratory tract to cause cough, or even severe coughing, ultimately leading to the patient's anxiety and intolerance to the tube; moreover, some patients might cough up the dropped humidification liquid, due to the irritating cough, which could also affect the humidification effect. The tube depth was tested after the intubation tube was removed, and it was found that part of the humidification tube was indeed unable to closely attach to the wall. In addition, the sputum attached to the removed endotracheal tube wall was mostly in the middle part of intubation tube, suggesting that the sputum coughed up to the tube wall was higher than the lower end of the humidification tube and thus failed to be well humidified.

5. Conclusion

In summary, through comparison and analysis of the results, it was found that when the endotracheal intubation continuous humidification tube's depth was 10 - 12 cm and infusion rate was 15 - 20 ml/h, the humidification effect was more satisfying. During the maintenance of artificial airway, it is essential to take effective measures to conduct airway humidification in a targeted way and to ensure smooth drainage of secretions, so as to achieve the optimal humidifying effects, maintain the normal functions of the respiratory tract, and lay a good foundation for the early recovery of the patients.

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