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Subjectivity of Nursing Students' Perception on Industrial Accidents: Q-Methodology

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Abstract

In case when the chronic physical symptoms or permanent loss of functions are caused by industrial accidents, the pain caused by this changes the whole lives of workers and their families. The purpose of this study is to identify the subjective opinions that nursing students have about industrial accidents and define the characteristics by type. Q methodology was used to determine the subjectivity of nursing students' industrial accidents. A total of 17 students from the A Department of Nursing were selected and asked 34 questions about industrial accidents. Collected data were analyzed using the QUANL PC program. As a result, the perception of industrial accidents was classified into three categories: 'social improvement request type', 'employer responsibility type', and 'cause removal type'. It is expected that this will help to identify nurses' perceptions of industrial accidents and to develop strategies for future workforce management. In addition, it will help develop measures to reduce industrial accidents at the social level.

Keywords: *Industrial accidents, Nursing student, Subjectivity, Q-Methodology, Nurse*

1. Introduction

In case when the chronic physical symptoms or permanent loss of functions are caused by industrial accidents, the pain caused by this changes the whole lives of workers and their families. As the loss of physical functions by industrial accidents could limit the movements of exercise and even daily life, the workers have limited roles in their home, workplace, and society, and the loss in social relation is caused, which works as a factor that makes it difficult for the victims to return to society. Especially, the injured workers who could not return to their workplace experience the economic hardship and alienation from society due to the severed social relations, and their negative psychological response could become a huge social problem [1]. The disabled by industrial accidents shows the severe depression and high anxiety originated from the sudden loss of physical functions and limited roles, and because of those psychological and social difficulties, they could lose the opportunities of rehabilitation or recovery of disabilities [2][3][4].

As the beings that should take care of victims of industrial accidents at hospital and industrial site, the nurses could become the victims of industrial accidents in the site where they are working for. According to the Article 16 of the Industrial Safety and Health Act, a health manager is a professional manpower assigned to workplace to assist the business owner or chief manager regarding the technical matters of health, and also to provide

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guidance/advices to the supervisor and staff in charge of safety, so that people with qualifications like doctor, nurse, industrial hygiene management engineer, and air pollution environmental engineer could be appointed as a health manager [5]. Thus, there are total 3,559 health managers assigned to domestic workplaces, and the manpower showing the biggest percentage is the occupational health nurse. Total 2,294 occupational health nurses(64.5%) are assigned to workplaces as health managers [6]. Also, examining in the aspect of occupational health of hospital nurses, the nurses' health problems are the results related to nursing work, so that they should be the subjects of interest in regard of industrial accidents [7].

As the core manpower occupying the biggest part of healthcare site, with the most contacts with subjects, the nurses should provide the safe and high-quality nursing to subjects within limited time in the rapidly-changing healthcare environment [8]. When dealing with subjects in nursing site, the subjectivity of perception has lots of effects on their nursing. Thus, it is important to understand the perception targeting the nurses and pre-service nurses. There are no researches on industrial accidents targeting nursing students.

Thus, this study aims to provide the basic data necessary for developing the differentiated educational programs according to the characteristics of each type of perception of industrial accidents, targeting the pre-service nurses before entering the nursing site, by understanding the subjectivity structure of industrial accidents in the perspective of nursing students.

1.2. Purpose

The objectives of this study are to provide the basic data for presenting the strategies for the education of nursing students, and also to provide the information about nursing students dealing with industrial accident patients, by examining the types of subjective perception of industrial accidents and the characteristics of types targeting the students of nursing department by applying the Q-methodology. The concrete research objectives for this are as follows.

1) The nursing students' subjective perception of industrial accidents is categorized.

2) The characteristics of each type of nursing students' perception of industrial accidents are analyzed and described.

2. Materials and methods

2.1. Study design

In order to achieve the objectives of this study, after considering the literature, media data, and preceding researches on industrial accidents, the subjectivity showing the types of subjective perception of industrial accidents is discovered targeting the nursing students who have experienced industrial accidents.

2.2. Q-Population and q-sampling selection

To extract the comprehensive statements about the effects of industrial accidents focusing on the currently-enrolled students of nursing department, the Q-populations were drawn through the processes like consideration of domestic/foreign relevant literature, open-ended questionnaire, and individual in-depth interview. By drawing about 200 Q-populations through those processes, and then integrating the collected literature through the consideration of domestic/foreign relevant literature, around 100 Q-populations were finally extracted.

After going through the procedure of reviewing and modifying the extracted Q-populations of this study, final 34 samples with high discrimination were selected.

2.3. P-Sample selection method

As a qualitative research emphasizing individuals' inertia focusing on differences in intraindividual semanticity or importance instead of interindividual differences, the Q-methodology is based on the small sample doctrine in which the characteristics are not clearly revealed when the P-sample gets larger because many people are concentrated in a single factor [9]. As the P-samples of this study, this study selected total 17 nursing students who voluntarily agreed on the participation in this study after fully explaining the objectives of this study to them.

2.4. Q-Classification and data analysis methods

The Q-classification process is the process in which each individual creates the voluntary definition of industrial accident, and in this study, the research subjects who were selected as P-samples classified the statements of Q-samples in the forced normal distribution method [6]. Using the Q-cards, the data was collected from total 17 students of nursing department in OO university. It took mostly 30-45 minutes for each research subject to complete the Q-classification. In the distribution of Q-samples, the research subjects classified the statements selected as Q-samples into from strong affirmation to strong denial according to the importance based on their own opinions. The statement(Q1) about industrial accidents was classified on the basis of 12-point scale. After that, in relation to the statements classified into both extremes, the interviews with the subjects were conducted afterwards. As the Q-factor analysis, the Principle Component Factor Analysis(varimax) was used. The classification of types was selected by considering the results of variously inputting the number of factors and the total variance explained on the basis of Eigen value 1.0 or more. Regarding the collected data, this study scored the transformed scores (1-12) given to each focusing on the forcedly-distributed cards in the Q-sample distribution table. Coding the given transformed scores in the order of Q-sample number, they were processed with the principal component factor analysis by the QUANL PC Program. For the data analysis, the QUANL PC Program was used [10][11].

2.5. Ethical consideration for research subjects

We obtained voluntary consents of the participants for our research and explained that any of them may discontinue to participate at any time during the research. All the information collected from this research were processed without identification of participants and were coded for Q-sorting to guarantee confidentiality of personal information.

3. Results

Social Improvement Request Type: The subjects belonging to Type1 were total six people. The subjects of Type1 showed the strong affirmation to the statements like 'The standard for recognition of industrial accidents is too high(Z=1.66).', 'The field investigation is an important matter for the management of industrial accidents(Z=1.51).', and 'The basic investigation should be frequently performed for the prevention of industrial accidents(Z=1.45).'[Table 1]. The subject with the highest factor weight in Type1 was No.3(1.9818), and the statements that were affirmed the most were No.5 and No.15. The

subjects of Type1 showed the strong denial to the statements like 'The occurrence probability of industrial accidents gets lowered in the capital area(Z=-1.16).', 'The occurrence frequency of industrial accidents gets lowered in larger companies(Z=-1.56).', and 'The occurrence probability of industrial accidents is high when the age is increased(Z=-1.53).'[Table 1]. The subject with the lowest factor weight in Type1 was No.11(0.5966), and the statements that were denied the most were No.19 and No.31.

In the characteristics of Type1, the subjects thought that it would be necessary to improve the overall social gaze at industrial accidents, and the relevant social support policies and system. They viewed that it would be rare to be recognized as industrial accidents as the standard for recognition of industrial accidents was too high, and there should be the system for preventing or researching industrial accidents in advance. They also thought that the workers suffering from industrial accidents should be reduced through this social surveillance system, and the industrial accidents would grow into a social problem in the future without any social improvement. Thus, Type1 was named 'social improvement request type'.

- Employer Responsibility Type: The subjects belonging to Type2 were total four people. The subjects of Type2 showed the strong affirmation to the statements like 'The regular rotating shiftwork decreases the probability of occupational diseases(Z=1.72).', 'The workplace is fully responsible for industrial accidents(Z=1.71).', and 'The psychological fatigue could generate industrial accidents(Z=1.58).'[Table 1]. The subject with the highest factor weight in Type2 was No.4(1.0961), and the statements that were affirmed the most were No.24 and No.34. The subjects of Type2 showed the strong denial to the statements like 'The occurrence probability of industrial accidents gets lowered in the capital area(Z=-2.26).', 'The health education has huge effects on the prevention of industrial accidents(Z=-1.62).', and 'In many cases, the recognition path of industrial accidents is the mass media(Z=-1.43).'[Table 1]. The subject with the lowest factor weight in Type2 was No.15(0.2843), and the statements that were denied the most were No.19 and No.12.

In the characteristics of Type2, the subjects perceived that the biggest cause for the occurrence of industrial accidents would be employers' responsibility such as management of industrial site, employer's perception, and improvement of working environment. They said that the diseases caused by industrial accidents could get worsened by psychological fatigue and underlying diseases, so in order to prevent this, the employers should thoroughly manage the environment, and also lower the frequency of exposure through rotating shiftwork, if possible. The employers should always pay attention to the workers' health, have the perception of industrial accidents, and also make efforts to reduce the occurrence rate of industrial accidents. Thus, Type2 was named 'employer responsibility type'.

Cause Removal Type: The subjects belonging to Type3 were total seven people. The subjects of Type3 showed the strong affirmation to the statements like 'The psychological fatigue could generate industrial accidents(Z=1.68).', 'The standard for recognition of industrial accidents is too high(Z=1.62).', and 'The field investigation is an important matter for the management of industrial accidents(Z=1.39).'[Table 1]. The subject with the highest factor weight in Type3 was No.7(1.6887), and the statements that were affirmed the most were No.6 and No.5. The subjects of Type3 showed the strong denial to the statements like 'The industrial accidents are originated from natural environment(Z=-1.90).', 'The occurrence probability of industrial accidents is low when the academic background is higher(Z=-1.89).', and 'The industrial accidents a lot occur to people with occupations of physical labor(Z=-1.78).'[Table 1]. The subject with the lowest factor weight in Type3 was No.8(0.4664), and the statements that were denied the most were No.1 and No.14. The Type3 focuses on the causes for industrial accidents. They said that the psychological fatigue or long working hours

would increase the occurrence rate of industrial accidents, and it would be needed to reduce the occurrence of industrial accidents by understanding the causes, and also to establish the management system for harmful environments. They were negative on the opinion saying that they would be occurring in general natural environment, and also against the thought in which they would be occurring more in people related to physical labor. Thus, Type3 was named 'cause removal type'.

Table 1. Q-statements on diet and Z-scores per factor (N=17)

Factor	No	Description	Mean (SD)	Z-score
Factor 1 (N=6)	5	The standard for recognition of industrial accidents is too high.	7.83(0.753)	1.66
	15	The field investigation is an important matter for the management of industrial accidents.	7.50(1.225)	1,51
	11	The basic investigation should be frequently performed for the prevention of industrial accidents.	7.17(1.169)	1.45
	19	The occurrence probability of industrial accidents gets lowered in the capital area.	2.00(0.894)	-1.16
	31	The occurrence frequency of industrial accidents gets lowered in larger companies.	2.33(0.816)	-1.56
	13	The occurrence probability of industrial accidents is high when the age is increased.	2,67(2.066)	-1.53
Factor 2 (N=4)	24	The regular rotating shiftwork decreases the probability of occupational diseases.	7.50(1.291)	1.72
	34	The workplace is fully responsible for industrial accidents.	7.50(1.291)	1.71
	6	The psychological fatigue could generate industrial accidents.	7.25(1.258)	1.58
	19	The occurrence probability of industrial accidents gets lowered in the capital area.	2.50(1.732)	-2.26
	12	The health education has huge effects on the prevention of industrial accidents.	2.75(0.500)	-1.62
	29	In many cases, the recognition path of industrial accidents is the mass media.	4.00(1.000)	-1.43
Factor 3 (N=7)	6	The psychological fatigue could generate industrial accidents.	7.71(0.756)	1.68
	5	The standard for recognition of industrial accidents is too high.	7.29(1.604)	1.62
	15	The field investigation is an important matter for the management of industrial accidents.	6.86(1.345)	1.39
	1	The industrial accidents are originated from natural environment.	2.71(2.628)	-1.90
	14	The occurrence probability of industrial accidents is low when the academic background is higher.	1.86(0.690)	-1.89
	3	The industrial accidents a lot occur to people with occupations of physical labor.	2.43(1.512)	-1.78

4. Discussion

In the results of this study, the types of subjectivity of industrial accidents perceived by nursing students were divided into Type1-'social improvement request type', Type2-'employer responsibility type', and Type3-'cause removal type', and this study aims to discuss the characteristics of each type.

The Type1 shown in this study was 'social improvement request type'. They thought that it would be necessary to have the social preventive measures or management for the occurrence of industrial accidents. If it is unavoidable to have the industrial accidents regardless of size or degree, the policies or regulations should be established more rationally and clearly to be helpful to workers. They said that the victims of industrial accidents would be still the relative weak in our society, so that it would be necessary to seek for the measures for protecting them.

The Type2 was 'employer responsibility type'. They thought that the employers should take actions in relation to the occurrence frequency of industrial accidents and follow-up management because the working environment or working condition that could be the direct causes for industrial accidents would be influenced by employers' management philosophy and efforts for the improvement. They thought that the employers' interest and support would influence the prevention of industrial accidents and even follow-up management, which could influence the overall industrial accident policies and system.

The Type3 was 'cause removal type'. This type paid attention to causes for the occurrence of industrial accidents, and the causes that could worsen the disease or symptom after occurrence. They thought that there should be some efforts to prevent and decrease the physical and psychological pains caused by industrial accidents by removing such causes. They said that this could even reduce the social cost required for the healthcare and enhancement of workers.

This research on the subjectivity would be helpful for changing the perception of industrial accidents in our society. Moreover, this study could be used as the basic data for the development of differentiated educational programs, by presenting the subjectivity structure of nursing students' perception of industrial accidents as pre-service healthcare providers, and the characteristics of each type.

However, this study only targeted a university, and it did not consider the factors having effects on the perception of industrial accidents when selecting the subjects, so that it is limited to generalize the results of this study. Thus, it would be necessary for a follow-up research to additionally verify the types by composing the Q-samples with various backgrounds.

5. Conclusion

This study aimed to establish the basic data necessary for presenting the change in the perception of industrial accidents and the direction of approach for nurses, through the subjective data analyzed by exploring the nursing students' subjective perception of industrial accidents, by applying the Q-methodology. In the results of this study, it was divided into total three factors. The types of industrial accidents perceived by nursing students were 'social improvement request type', 'employer responsibility type', and 'cause removal type'.

This study has provided the basic data for establishing the measures for the improvement of attitude and perception of industrial accidents in the future, by categorizing the nursing students' subjectivity of industrial accidents. As this study analyzed the types of perception of industrial accidents and also verified the characteristics targeting the nursing students, it is expected to see the development of educational programs considering the characteristics of

each type. This study also suggests an additional research on the analysis of types after selecting the samples by considering various factors, and a qualitative research for verifying various factors having effects on nursing the subjects of industrial accidents.

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