Subjectivity for Shift-Work of Nursing Students

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Abstract

The purpose of this study is to identify the subjective opinions that nursing students have about shift work and define the characteristics by type. Q methodology was used to determine the subjectivity of nursing students' shift work. A total of 17 students from the A Department of Nursing were selected and asked 38 questions about shift work. Collected data were analyzed using the QUANL PC program. As a result, the perception of shift work was classified into three categories: "reversible side effects recognition", "non-recoverable side effects worried", and "pros and cons considered." It is expected that this will help to identify nurses' perceptions of shift work and to develop strategies for future workforce management.

Keywords: Shift Work Schedule, Nurses, Students, Perception, Preventive Health Services

1. INTRODUCTION

1.1. BACKGROUND

It is essential for the hospital to provide services for 24 hours. So nurses in wards, intensive care units, and emergency departments usually work three shifts a day. Shift work cycles vary from two to three days, one week, or several weeks[1]. Nowadays, the shift work system is introduced in various occupations to provide convenience to customers. However, shifting parties work at times that do not match their physical rhythms, which can cause physical and psychological side effects[2, 3].

In recent years, the rights of patients have become important in society, and expectations for the quality of nursing services for patients have been increasing. Thus, the physical and mental stress of nurses is also increasing. But because of the lack of nursing staff in the hospital, nurses are under stress due to overload[4]. The health of nurses is very important because they can affect patient safety[5].

Sleep time for shift workers is irregular. This leads to poor quality sleep, which leads to unstable biorhythms[6, 7]. In the long run, shift workers are more tired than those who are not, which increases

the risk of accidents. These sleep disorders and fatigue during shifts can increase the likelihood of medical accidents by making it difficult for patients to make mistakes, malfunctioning medical devices, and understanding patient status[8, 9]. It also can be a barrier to shift workers living a healthy life[7].

The stress and fatigue of shift nurses are very high and the quality of sleep is poor compared to those who do not[10, 11]. Many studies have shown that nurses who work shifts have the most sleep disorders[12]. For a long time, the medical accidents among shift nurses has been a health care issue of society.

Not only do nurses have the greatest number of jobs in the healthcare field, they are the key human resources who have the most contact with the mother and baby and should provide safe and high quality nursing care to the mother and baby within a limited time in a rapidly changing healthcare environment[13]. The subjectivity of perception in dealing with mothers and babies in the nursing field has a great impact on the nursing they perform. Therefore, it is important to understand the perceptions of nurses and prospective nurses.

However, few have studied the perceptions of nursing students about shift work. Q methodology can collect subjective opinions of participants,

classify them into various types, and organize their characteristics. In particular, results can be derived from the perspective of the participants rather than from the perspective of the researcher[14]. The Q methodology is used in this study because nursing students' perception of shift work is their own experience.

The purpose of this study is to understand the subjectivity of shift work from the perspective of nursing students. The aim is to relieve the negative perceptions they have of shift work and to provide the basic data necessary to develop workforce management programs for each type.

1.2. PURPOSE

This study uses Q methodology to collect subjectivity and classify subjectiveness of nursing students' shift work and define each type. The data collected will be used as a training resource for students who will work shifts in the future. The purpose of this study is as follows.

1) Type the subjective opinions that nursing students have about shift work.

2) Define perceptions of shift work by type, then analyze their characteristics.

2. MATERIALS AND MEHTODS

2.1. STUDY DESIGN

In order to achieve the purpose of the study, we first reviewed the literature, media data and research results on shift work. And we collected opinions about shift work from students who have already experienced shift work.

2.2. Q-POPULATION AND Q-SAMPLING SELECTION

First of all, in order to derive the Q-population, the interviews and questionnaire were conducted for students in the nursing department. Based on domestic and international research data on shift work, a total of 200 questions in three areas were first extracted. And we proceeded to select this to 100 again. Finally, a total of 38 final questions were selected by expert review.

2.3. P-SAMPLE SELECTION METHOD

Q-methodology is a research method that can identify differences according to an individual's unique experience. This method was conducted in consideration of the "small sample doctrine" that the larger the P-sample, the more biased the opinions are in a particular area and the results may be different[15]. Among the students in the department, 17 participants were selected who indicated their willingness to participate.

2.4. Q-CLASSIFICATION AND DATA ANALYSIS METHODS

Q-classification is the process of defining opinions on shift work for each individual by classifying them into forced normal distribution according to the answers of participants selected as P-sample[15]. Data were collected using a Q-card from 17 students in the A Department of Nursing. The average time spent per study respondent was 30 to 45 minutes. The distribution of Q-samples was classified by classifying the respondents' responses to Q-samples from strong positives to strong negatives. Thereafter, interviews were made with attendees regarding answers categorized at both ends. As the Q-analysis factor, Principle Component Factor Analysis (varimax) method was used. Classification of types was based on Eigen value 1.0 or higher. The results and variances calculated by varying the number of factors were considered. Collected data were scored on a scale of 1 to 10, centered on cards forcibly distributed in the Q-sample distribution table. The assigned conversion scores were coded in Q-sample number order and processed by Principle Component Factor Analysis (varimax) by the QUANL PC Program[16-18].

2.5. ETHICAL CONSIDERATION FOR RESEARCH SUBJECTS

Before starting the study, participants were informed that they could discontinue at any time at their own discretion. All information collected for the rights and privacy of attendees was coded and stored anonymously.

To ensure the autonomy of participants, the purpose of the research, the method of research, and

the recording of the interview contents were explained first before the meeting.

Then, the ethical aspects of the box were considered by obtaining verbal consent, receiving consent, and making compensation commensurate with participation in the research. As a measure not to violate the privacy of participants according to the principle of bad behavior, It was informed that the interview would be used only for research purposes, and personal situations were kept secret while ensuring anonymity. Also, It was informed that the research results would be published and the participants could stop participating in the research anytime they want. In order to avoid revealing the identity of research participant, the computer file was assigned a unique password for the researcher and all information that could identify the participant was deleted.

3. RESULTS

3.1. STRUCTURE OF Q TYPE

In order to divide the nursing students' perceptions of shift work by type, the answers to Q-samples. The distribution of 17 participants was seven for the first type, four for the second type, and six for the third type. As a result of dividing the group by similar responses to the shift work, it was divided into three types.

Participants in this research conveniently were extracted from 17 nursing college students who were found to have experienced more than one clinical practice in the fourth grade of the nursing department in S. The general characteristics of the research subjects are as shown in [Table 1]. The total number of people surveyed totaled 17 with the average age being 22.29±0.92, and 5.9 percent for boys and 94.1 percent for girls. Among them, 70.6 percent did not have a religion and 29.4 percent had a religion, and the number of weeks was 11.12 ± 1.36 weeks.

Table Ⅰ. General Characteristics

Type	No	Age	Gender	Grade	Religion	Number of Practices(by the week)	FWS*
Type 1	1	22	F	4	No	11	.6310
	4	21	F	4	No	10	.4465
	5	24	F	4	No	12	.2624
	6	22	F	4	No	13	5453
	9	23	F	4	Christian	13	1.0292
	15	21	F	4	Catholic	10	.7666
	16	23	F	4	No	9	1.0255
Type 2	2	21	F	4	No	11	.2612
	3	22	F	4	No	12	3.2926
	12	22	F	4	No	10	.3927
	17	24	M	4	Christian	10	.8382
Type 3	7	23	F	4	Christian	13	.3143
	8	23	F	4	No	10	.3192
	10	22	F	4	No	13	.4138
	11	22	F	4	Catholic	12	.6375
	13	22	F	4	No	10	1.5101
	14	22	F	4	No	10	.7495

*FWS: factor weight score

3.2. SUBJECTIBITY AND TYPE-SPECIFIC CHARACTERISTICS OF SHIFT WORK

In order to divide the nursing students' perceptions of shift work by type, the answers to Q-samples were first collected and divided into three types. In the Q-method, each type finds a person with a high "Factor weight" and identifies them as an "ideal person" representing that type.

The classification was based on the case where the standard score was 1.00 or higher among the responses to the collected Q-samples. Persons with a "Factor weight" of 1.00 or greater were counted seven for Type 1, four for Type 2, and six for Type 3[19, 20].

In order to analyze the subjectivity of the shift work of the students in nursing department, it was finally classified into three types using the PC QUANL program. This accounts for 49.10% of the total variable. The ratio of variances for the three types is 25.58% for the first type, 10.61% for the second type, and 9.91% for the third type. According to the study, the subjectiveness of the perception of shift work among nursing students is represented by the first type, accounting for 28.58%[Table 2].

Table Ⅱ. Life Eigen Value, Variance, and Cumulative Percentage

Hospitals	Type I	Type II	Type III
Eigen Value	5.7157	2.1213	1.9828
Variance(%)	.2858	.1061	.0991
Cumulative(%)	.2858	.3919	.4910

The correlation coefficients between the three factors are shown in [Table 3]. This shows the degree of similarity among the three types. The correlation coefficient between type 1 and type 2 is 0.3732. type 1 and type 3 is 0.8030, and 0.5151 in type 2 and type 3. Type 1 and type 3 had a relatively high positive correlation with other types. However, the correlation between factors in the Q method is different from the factor analysis method in the quantitative research, and since it focuses on finding the factors without presupposing the complete independence between the factors, there is no controversy over the method of factor extraction based on the high and low correlation.

Table Ⅲ. Correlations Between Factor Scores

Hospitals	Type I	Type II	Type III
Type I	1.000	.3732	.8030
Type II	-	1.000	.5151
Type III	-	-	1.000

3.2. ANALYSIS BY TYPE

The types of perceptions of nursing students about shift work classified through the above process are as follows.

6.1.1. REVERSIBLE SIDE EFFECTS RECOGNITION TYPE: A total of seven respondents were classified as first type. Questions that strongly indicate a positive affirmation by this type of subject include: Shift work is difficult to get a good night's sleep because of shift work, which causes sleep disorders and chronic fatigue (Z=2.03), The physical rhythm is broken because of shift work (Z=1.95) Shift work is the cause of chronic fatigue (Z=1.69)[Table 4]. The 9th (1.0292) had the highest "Factor weight" in Type I. The questions he most agreed to were 2, 1 and 27. Questions that

strongly indicate negative intentions of the first type of subject are as follows.

Drug abuse increases due to shift work (Z=-1.82), Shift workers have less sense of belonging to the organization (Z=-1.72), Shift work affects smoking (Z=-1.37)[Table 4]. Participants with the lowest "Factor weight" in Type 1 were No. 5 (0.2624). The strongest and most negatively answered questions were 31, 37 and 24.

Respondents of the first type were answered that shift work can be cause of some side effect, but they thought they were recoverable. It is essential for nurses to work shifts to care for patients, which causes fatigue and stress from sleep disorders. However, it appears that they do not significantly affect the mentality or habits of nurses. New nurses may find that shifting early may feel burdensome, but thinks they will adapt over time. Therefore, the first type was named "reversible side effect recognition type".

6.1.2. NON-REVERSIBLE SIDE EFFECT WORRY TYPE: A total of four respondents were classified as the second type. Questions that strongly indicate a positive affirmation by this type of subject include: The physical rhythm is broken because of shift work (Z=2.06) It is difficult to get a good night's sleep because of shift work, which causes sleep disorders and chronic fatigue (Z=1.75), Reproductive function is impaired by shift work (Z=1.56)[Table 4]. The 3th (3.2926) had the highest "Factor weight" in Type 2. The questions he most agreed to were 1, 2 and 28. Questions that strongly indicate negative intentions of the second type of subject are as follows.

Shift work naturally leads to extension of work (Z=-1.81), Fixed shift work can stabilize life rhythms and return work performance to normal (Z=-1.56), Shift work cycles affect turnover (Z=-1.34)[Table 4]. Participants with the lowest "Factor weight" in Type 2 were No. 2 (0.2612). The strongest and most negatively answered questions were 18, 36 and 20.

Participants in the second category considered shift work to be the cause of physical, psychological and mental side effects. They also concluded that they could not recover even after returning to normal life patterns. The shift workers felt that the side effects would be worse because they were in an

unsuitable environment to care for their health. Accordingly, the second type was named "non-recoverable side effect worry type".

6.1.3. PROS AND CONS CONSIDERATION TYPE:
A total of six respondents were classified as third type. Questions that strongly indicate a positive affirmation by this type of subject include: New nurses do not sleep deeply while adjusting to shift work (Z=1.78), The physical rhythm is broken because of shift work (Z=1.73), Employees who are satisfied with their work shift can maintain their mental and physical health (Z=1.55)[Table 4]. The 13th (1.5101) had the highest "Factor weight" in Type 3. The questions they most agreed to were 8, 1 and 34.

Questions that strongly indicate negative intentions of the second type of subject are as follows: Shift work affects smoking (Z=-1.93), Drug abuse increases due to shift work (Z=-1.83), Shift work causes family discord (Z=-1.83)[Table 4]. Participants with the lowest "Factor weight" in Type 3 were No. 7 (03143). The strongest and most negatively answered questions were 24, 31 and 30.

Participants in the third category thought that shifts could have side effects, but could be relieved according to their will and circumstances. They felt that if they were satisfied with the shift, they would be able to stay healthy and provide opportunities for self-achievement. Accordingly, the third type is called "pros and cons consideration type."

Table Ⅳ. Representative items on smartphone addiction and Z-score (N=17)

Factor	Type	No	Representative items	Mean(SD)	Z-score
Representative items of type					
Factor1 (N=7)	Type1	2	It is difficult to get a good night's sleep because of shift work, which causes sleep disorders and chronic fatigue.	8.71(0.756)	2.03
		1	The physical rhythm is broken because of shift work.	8.86(0.9)	1.95
		27	Shift work is the cause of chronic fatigue.	8.43(1.512)	1.69
		3	The shift cycle is not regular, causing side effects in the nervous system.	7.86(1.215)	1.61
		8	New nurses do not sleep deeply while adjusting to shift work.	8.00(1.155)	1.33
	Type2	31	Drug abuse increases due to shift work.	2.57(1.718)	-1.82
		37	Shift workers have less sense of belonging to the organization.	2.71(1.604)	-1.72
		24	Shift work affects smoking.	2.86(1.345)	-1.37
		38	Shift work cannot meet a person's physiological needs.	3.57(3.101)	-1.31
		33	Shift work slows memory and reaction.	3.57(2.070)	-1.15
Factor2 (N=4)	Type3	1	The physical rhythm is broken because of shift work.	8.75(0.957)	2.06
		2	It is difficult to get a good night's sleep because of shift work, which causes sleep disorders and chronic fatigue.	8.75(0.957)	1.75
		28	Reproductive function is impaired by shift work.	7.50(1.291)	1.56
		38	Shift work cannot meet a person's physiological needs.	8.75(0.957)	1.52
		27	Shift work is the cause of chronic fatigue.	8.50(0.577)	1.42
	Type4	18	Shift work naturally leads to extension of work.	4.25(3.403)	-1.81

Factor	Type	No.	Statement	Mean(SD)	
		36	Fixed shift work can stabilize life rhythms and return work performance to normal.	4.00(3.599)	-1.56
		20	Shift work cycles affect turnover.	4.25(2.630)	-1.34
		35	Fixed shift work promotes good health.	4.50(1.732)	-1.29
		15	Shift work increases the frequency of contact with the patient so that the patient's condition can be accurately observed.	4.00(2.000)	-1.19
Factor3 (N=6)	Type5	8	New nurses do not sleep deeply while adjusting to shift work.	7.83(1.722)	1.78
		1	The physical rhythm is broken because of shift work.	8.00(0.894)	1.73
		34	Employees who are satisfied with their work shift can maintain their mental and physical health.	7.00(2.757)	1.55
		2	It is difficult to get a good night's sleep because of shift work, which causes sleep disorders and chronic fatigue.	8.00(1.789)	1.49
		37	Shift workers have less sense of belonging to the organization.	6.17(2.787)	1.00
	Type6	24	Shift work affects smoking.	2.67(1.751)	-1.93
		31	Drug abuse increases due to shift work.	3.17(1.169)	-1.83
		30	Shift work causes family discord.	2.83(0.753)	-1.83
		10	Shift work can neglect my relationship with my child.	3.50(1.378)	-1.41
		6	Shift work can cut off conversations with family members.	6.50(0.837)	-1.34

4. DISCUSSION

According to the results of this study, the subjectiveness of nursing students' shift work is classified into three categories. The first type is "reversible side effect recognition type", the second type is "non-recoverable side effect worry type", and the third type is "pros and cons consideration type" and the characteristics of each type are as follows.

The first type identified in this study is "reversible side effects recognition". Attendees of this type believe that shifts are essential because the job of a nurse must take care of patients 24 hours a day. They think that shifts can cause side effects, but they can be restored depending on the lifestyle. They think it's hard to work shifts but they can stand it.

Nurses work shifts, changing day and night, getting a good night's sleep only on off days, and experiencing stress-induced appetite. They also prefer to simplify their meals because they are very busy. According to the results of Hwang Seol-hyun[21], the tendency to reduce the burden on work by increasing the physical strength through the usual health care is also confirmed. Since the hospital has to take care of the patient for 24 hours, the three shifts of nurses are essential. Nurses 'health care is even more important because it is very difficult to maintain good lifestyles because of irregular working hours[22]. In particular, nurses' shift work is a source of stress, so a physical activity promotion program should be prepared for them as soon as possible.

Nurses' stressors vary. Roles among other stressed health care workers, patients and caregivers, increased demands for expertise and skills, conflicts with various people, aspirations for poorly performing care and poor working conditions[23]. Nurses' stress management is

directly related to their job satisfaction and self-esteem. That is why it is so important to develop an active strategy for nurse stress management.

The second type is "non-recoverable side effects worry". Attendees of this type believe that the side effects of shift work cannot be recovered. If possible, they also tend to hope for a full-time job or other job that does not work shifts. Above all, they put their health first, and they have a vague fear of this even though they had not yet started their shift work.

Previous studies have shown that shift work causes sleep disorders and fatigue[2, 15]. The fatigue of shift workers is higher than those who do not work shift shifts. People who feel tired a lot are passive in their health care. A study of shift nurses[1] found that physical fatigue manifests itself as psychological side effects such as depression.

Nurses' daily stress care is very important because there are many causes of stress, such as overwork, shift work, and the potential for exposure to infectious diseases. Nurses' health care can affect not only the nurse but also the patient. However, according to the previous research on the health care of nurses is significantly lower than other occupations. Especially, it was very rare for people to eat regularly or exercise regularly[4, 24, 25]. Nurses are responsible for positively affecting patients by leading them to promote proper health as a role model for their health.

The third type is "pros and cons consideration". Attendees of this type were found to think that shifts could be a source of side effects, but that they could take advantage of them. They do their best to actively manage their health and adapt to shift work. So if there is policy support for nurses working in shifts, we think that the rate at which nurses leave because of shifts will be reduced.

Nurses make up 30-40% of the hospital's total workforce and spend the most time with patients[26]. They play a very important role, but their work environment is very poor. The number of patients in charge of one general hospital nurse in Korea is 16.3, more than three times that of the United States. The labor emphasis of Korean nurses was about 3.5 to 4 times higher than in OECD countries[27].

In March, the Ministry of Health and Welfare announced a plan to improve the working environment and treatment of nurses[28]. The improvement measures included research projects to develop shift work patterns according to the characteristics of each ward in order to reduce the burden on the nurses. However, since this targets small and medium-sized hospitals, it is expected that it will take a long time to be apply for nurses working in advanced general hospitals. But the introduction of a health care program for nurses will help relieve the side effects of shift work.

In this study, we were searched about subjective opinions that nursing students have about shift works and classified into three types by the characteristics and analyzed. This may help to develop a workforce management program for shift nurses, which has recently gained increasing attention.

However, it was not easy to generalize the results of this study because a questionnaire was conducted for one university and the participants were selected by excluding factors affecting the perception of shift work. Therefore, further research is needed to construct a Q-sample with various backgrounds and further verify the classified types.

The above results are thought to be helpful to understand the structure of awareness of how nursing college students perceive shift work. However, this research analyzed 17 nursing college students and it is difficult to generalize the perception of shift work. Therefore, we hope that repetitive research on nursing college students and nurses will be carried out based on the results of this research, and based on a correct perception of shift work, we hope that the development of educational programs will help nursing students overcome vague fears of shift work and adapt well as nurses.

5. CONCLUSION

Because humans are unique and human beings, individual and integrated research of subjectivity is inevitable to understand the perception of medical decisions. This research, using Q methodology, seeks to present basic data to enhance the ability to perform a role as a nurse in clinical sites by identifying the subjective perception types of nursing students in shift work.

This study collected and analyzed subjective perceptions of nursing students' shift work. In addition, based on the research results, it was intended to be used as a basic data for finding ways to activate shift work. Through research, perceptions of shift work were classified into three types. These are "reversible side effects recognition", "non-recoverable side effects worry" and "pros and cons consideration".

This study types the subjectivity of nursing students' shift work. These classified types served as the basis for introducing supportive policies to overcome the adverse effects of future shift work. Based on the results of this study, it is expected that the workforce management program for nurses working in the future will be developed. In addition, in order to generalize the results of this study, it is suggested to select additional samples considering various factors for further study.

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