

## Subjectivity of Nursing Students' Experience of Simulation Based Learning : An Application of Q-methodology

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**Abstract.** The purpose of this study is to identify the subjective factors and structures of the nursing students' experience in simulation based learning using Q-methodology. 38 statements as a Q-sample are selected from the in-depth interview, and P-sample consists of 37 nursing student who experienced simulation based education. The 38 selected Q-statements from each of 35 participants were classified into the shape of a normal distribution using a 9-point scale. The collected data was analyzed using the pc-QUANL program. : Results The collected data was analyzed using the pc-QUANL program. The results revealed two discrete groups of students toward simulation based learning: 'Nursing Competence awareness', 'integrated approach, 'emergency Nursing response training,' and, 'Change of learning type'. Conclusion: The findings revealed that teaching and learning strategies based on the four factors of attitudes could beneficially contribute to the customization of simulation-based learning.

**Keywords:** Nursing education, Nursing students, Patient simulation

### Introduction

Simulated based learning, which takes many forms including multimedia technology, models, patients and simulators, is a new training strategy that improves the safety of patients in the field of medical science and nursing. This method serves as an alternative to prevent mistakes by medical professionals, and training through simulators has been proven to be effective [1]. Clinical trainings through simulation based learning require students to actively participate in it practices and transform their old paradigm. Thus, it is important for nursing students to realize and experience how to be best equipped with and be prepared for this new learning method.

Therefore, due to the difficulties of practicing in the real clinical setting, simulation based learning has come to the fore as an alternative. Simulation-based learning is a highly advanced educational method that promotes technical/ non-technical skills, increases team competency, and improves teamwork through health care team interaction in a safe environment with no potential for harm to the patient[2],[3],[4].

The main objective of this study was to identify subjective including attitudes of under graduated nursing toward the simulation based learning. This study could be used as a basic material for creating and enhancing step-by-step modules that benefit students' capabilities and for developing strategies to ensure the improved ability of students in adapting to the simulation based learning.

## **Methods**

### **Research Design**

This study applied a Q-methodological approach to explore and describe the attitudes of undergraduate nursing students toward simulation based learning. Q-methodology is useful to explore each person's subjective viewpoints and identify individual attitudes, feelings, perceptions, and values toward an object [5], and is an appropriate research method to clarify nursing student's attitudes toward simulation based learning.

### **Q-methodology**

Q-methodology was introduced in 1935 by Stephenson. Q-methodology as an integrated research approach uniquely synthesizes the advantage of quantitative and qualitative methods [6].

This methodology provides a scientific method for identifying perception structures that exist within certain individuals or groups. The focus is on individuals' attitudes and perceptions that have been gained from personal experience, and feelings [7]. Because Q-methodology deals with the measurable subjectivity of the individual, it is possible to measure subjective attitudinal structures.

Subjectivity means nothing more than a person's communication of his/her point of view, and can be defined by internal factor: interpersonal relationships, individual attitudes, impressions, perceptions, feelings, and opinions, rather than external factors[6].

### **Q-Sample.**

After conducting a survey and a series of in-depth interviews on 37 third-grade nursing students in University "J" located in the city of "J", 300 statements were collected. In-depth interviews were conducted with seven students in order to clearly

understand their statements and additional comments. The main question was, “How was the simulation based learning, and how so?”. Three categories were drawn (nursing knowledge, nursing practice, communications) after grouping statements into similar topics. There are seven to fourteen statements in each category. 38 Q-samples were extracted by selecting the most different and distinguished ones (Table 2). Pilot tests were conducted on five students to test the confidence levels on the chosen samples. They were extracted after being verified and edited by two professors of nursing literary review.

### Data Analysis

The pc-QUANL program was used to analyze the Q sorts. Relevant to the analysis of Q sorts was the following three points; using eigen values of at least 1.0 for the final interpretation, conducting varimax rotation in order to maximize the variance between each factor, and adopting Z-score as a measure of standard deviation (statements with a Z-score above+1.0 as positive views and below-1.0 as negative views). A best estimate for each factor was calculated using factor weightings that demonstrate the extent of an individual Q sort in each factor .

### Result

After conducting Q-factor analysis, the subjectivity of nursing students who received Simulation Based Learning was categorized into four Q-factors. These Q-factors explain 46.50% of all the variables, which each Q-factor explaining 20.50%, 9.86%, 8.42%, and 7.72%, respectively . Correlations between factors of subjectivity are as follows: 0.140 between the Factor 1 and Factor 2, 0.198 between Factor 1 and Factor 3, 0.327 between Factor 1 and Factor 4, 0.056 between Factor 2 and Factor 3, 0.152 between Factor 2 and Factor 4, and 0.296 between Factor 3 and Factor 4.

#### Factor 1: Recognizing the nursing Nursing Competency

Factor 1 showed strong agreement on statements such as ‘Nurses are required accurate skills and requires appropriate interventions and communication and critical thinking competency. (Z =1.96 )’, ‘SBL was an opportunity to recognize the importance of this educational intervention capability ability of nurses. (Z=1.81)’, ‘Nurses must have realized that the more knowledge so that doctors might be some indication. (Z=1.80)’, ‘I realized that the judge should communicate well and quickly when you know a lot of nurses and decisions. (Z=1.56 )’.

Factor 1 is characterized by those who recognize that nursing can only be complete after receiving a sound response from the patient and who experience that it is important to check and properly measure the results. Thus, Factor 1 is referred to as ‘recognizes the nursing Nursing Competency.’

**Table 1.** Factor weights and characteristics of participant

Factor	participant no	Factor weight	Characteristics	Summary
1 (N=7) Recognizing the nursing Nursing Competency	10	1.0669	Mean age =21(yeas) Female = 6 (85%) Male = 1 (15%)	Simulation based Learning is the experience that it is important to determine and measure the result of nursing.
	11	.4438		
	14	1.1150		
	18	1.1451		
	19	.6870		
	29	2.0133		
	30	.5144		
2 (N=7) Recognize the importance of integrated nursing	3	.6282	Mean age = 22(yeas) Female = 7 (100%) Male = 0 (0%)	Simulation based learning was an opportunity to integrate that learning intervention for each of the subjects , themes and organs.
	8	.5399		
	9	.4465		
	17	.7456		
	22	2.4520		
	31	.9965		
3 (N=10) Recognizes the improvement of the ability to respond to the emergency	1	.5875	Mean age = 21(yeas) Female = 8 (80%) Male = 2 (20%)	Simulation based learning is useful to deal with training for emergencies.
	7	.3648		
	12	.5289		
	21	1.1785		
	23	.6380		
	24	1.1200		
	26	.6890		
	27	.4605		
	28	.8285		
	35	1.2502		
4 (N=11) Recognizes the transform of the learning methods	2	.5296	Mean age = 21(yeas) Female = 9 (82%) Male = 2 (18%)	Simulation based learning has brought a Transform in learning methods.
	4	1.1060		
	5	.7824		
	6	.8128		
	13	.9656		
	15	1.6558		
	16	.3643		
	20	.6302		
	25	.5407		
	32	.9725		
	33	.9144		

**Table 2.** Q Statement and tpyal array of Z-scores.

Item	Q-Statement	Z-score			
		factor1 (n= 7 )	factor2 (n= 7 )	factor3 (n= 10 )	factor4 (n= 11 )
1	SBL was an opportunity to recognize the importance of this educational intervention capability ability of nurses.	0.18	1.15	1.14	1.34
2	SBL allows practical experience similar to the actual situation.	-1.18	-1.07	-0.21	-1.51
3	SBL is to prepare for emergency situations was useful opportunity to enhance the training and coping skills	-0.46	-0.68	0.51	-0.09
4	I think the scenario for the entire process of the patient from hospital admission to discharge day will help.	-1.04	1.42	-0.73	-0.58
5	SBL got a sense of security that you need to do your best, so I will hypothetical situations	-1.45	1.06	-0.12	-0.81

6	The experience was SBL means for determining and applying the patient's priority arbitration is applied to select the arbitration for the symptoms.	1.01	1.07	0.54	0.47
7	SBL Was worth the experience to deal with the immediate situation facing Nursing as a uniform.	0.14	1.32	1.01	.042
8	I realized that this was likely to happen in a variety of clinical tasks.	1.79	1.54	-0.19	1.26
9	This was a valuable experience to solve the problem by mobilizing a field that can be used in addition to experience, knowledge and resources been expected.	-0.79	0.45	0.84	0.20
10	After the simulation, I will be expected to apply to the Situation when I study the nursing process.	-0.77	-0.24	-0.21	1.10
11	Because if I did not care for the correct patient, the patient will die, that I was restless and can not own.	-0.19	1.12	-1.67	-1.84
12	I seemed to be working as a nurse in a clinical rather than a nursing student.	-0.76	0.24	-1.76	-2.7
13	Before the simulation exercise, I was studying to focus on the patho- physiology but, after the SB to focus on how I study to assess the patient's response.	0.34	1.06	0.46	1.74
14	Nurses must have realized that the more knowledge so that doctors might be some indication.	1.80	1.32	-0.42	2.32
15	I could feel a sense of accomplishment when you wish to perform nursing results.	0.23	-0.31	1.02	0.07
16	I think it is very important to explain to patients and care givers are good when nursing interventions.	1.61	1.01	0.63	1.63
17	I realized that the judge should communicate well and quickly when you know a lot of nurses and decisions.	1.56	0.57	0.79	-0.28
18	I felt a sense of responsibility to the patient about what is appropriate care to patients was due to my lack of knowledge.	1.44	0.62	1.02	-0.63
19	I was loving this look within themselves to understand and respond to the nursing situation.	0.52	0.24	-1.32	-0.72
20	This experience was a valuable experience to the decision to adjust the values of the different people in the team are.	0.42	-0.72	0.24	-0.21
21	It was found that the first priority of solving the problem is right or wrong, but different.	-0.20	-0.70	-1.11	-1.17
22	We have to reflect on their own values by comparing what they think are your friends.	0.03	0.24	0.31	-0.73
23	Observe the intervention and communication skills to perform the same team with me and my friends were motivated me.	1.81	-0.92	0.61	0.59
24	It self that other colleagues were uncomfortable and bear watching.	-01.6	-1.0	-1.55	.88
25	It was an opportunity to try to apply an integrated intervention for each subject .	1.77	1.82	-0.58	1.49
26	Nurses are required accurate skills and requires appropriate interventions and communication and critical thinking competency.	1.96	-1.6	0.32	0.74
27	SBL was up information and experience to identify the patient as well as the circumstances surrounding the patient.	0.13	0.42	-0.70	-0.10
28	Since SBL class ECG, NST figures such as graphs were aware of the symptoms of the patient.	-0.13	0.14	-0.21	.80
29	The respective roles and competencies seems that they need to develop in accordance with the rank of nurses.	-0.19	1.34	0.09	-0.21
30	I became confident that after the simulation-based learning to cope with emergency situations.	0.92	-0.51	1.75	-1.02
31	I felt a companionship when you successfully perform together with colleagues from the SBL.	0.14	-2.17	0.67	0.01
32	Medical examination results mean the condition of the patient, and realized that the basis of the intervention.	0.11	-0.61	-1.69	1.50
33	Well educated than to apply clinical skills to patients that looked more competent.	-0.52	-0.60	0.81	0.92
34	I prior to performing a medical attention instead to treat the acute symptoms of the patient were found not to me appropriate address the condition of the patient.	0.40	0.60	-1.69	-0.67
35	I was learning to account for, unlike previously, and the symptoms, treatment and priority for intervention.	0.71	-1.31	-.02	.50
36	I experienced that are improving the symptoms of patients who received my care after treatment was convinced and confident with my knowledge and mediation skills.	-1.53	-1.6	0.51	-0.89
37	I realized that the knowledge and care activities that I need to do to apply for a real person.	-0.79	0.34	2.11	-0.28
38	SBL was a chance to learn how to communicate, including how do you get a prescription order and report to a doctor a nurse.	-1.81	-0.52	0.19	-0.32

## Factor 2: Recognizing the importance of integrated nursing

Factor 2 is characterized by those who had experienced integrating their nursing knowledge of different subjects, topics and organs that they had learned during the simulated training. They recognized the importance of integrating knowledge from different subject. Thus, Factor 2 is named 'the factor that recognizes the importance of integrated nursing.'

Factor 2 had affirmative answers on statements such as 'Nurses are required accurate skills and requires appropriate interventions and communication and critical thinking competency. (Z=1.82)', 'It was an opportunity to try to apply an integrated intervention for each subject. (Z=1.82)', 'SBL Was worth the experience to deal with the immediate situation facing Nursing as a uniform. (Z=1.32)', 'The experience was SBL means for determining and applying the patient's priority arbitration is applied to select the arbitration for the symptoms. (Z =1.32)''.

**Factor 3: Improving the ability to handle emergency situations by training**

Students in Factor 3 recognized that they have improved their ability to handle emergency situations by conducting simulated training on those situations, thereby gaining confidence. Factor 3 had more affirmative answers on statements such as 'I realized that the knowledge and care activities that I need to do to apply for a real person. (Z =2.11 )', 'I became confident that after the simulation-based learning to cope with emergency situations. (Z=1.75 )', 'SBL is to prepare for emergency situations was useful opportunity to enhance the training and coping skills.(Z =1.51 )', 'SBL Was worth the experience to deal with the immediate situation facing Nursing as a uniform. (Z =1.01 )'.

**Factor 4: Transforming learning methods**

Students in Factor 4 used to learn nursing by memorizing materials on or related to pathological physiology but recognized the importance of nurses' ability to properly assess the response and the status of a patient in a clinical environment. Thus, it is assessed that after receiving simulated training, they attempted to transform their learning methods.

Factor 4 students had affirmative answers on statements such as 'Before the simulation exercise, I was studying to focus on the patho-physiology. However, after the simulation exercise is to focus on how I study to assess the patient's response and condition, normal signs and symptoms of abnormal. (Z=2.32 )', 'Nurses must have realized that the more knowledge so that doctors might be some indication. (Z =1.3)''', 'I think it is very important to explain to patients and care givers are good when nursing interventions. (Z =1.63 )', 'Medical examination results mean the condition of the patient, and realized that the basis of the intervention(Z =1.50 )'

## **Conclusion**

This research was written in an attempt to explore the subjective factors and their characteristics using Q methodology on the experience of nursing students who participated in the simulated training. The results suggest the subjective factors of nursing students' experiences can be grouped into four categories: 'Recognizes of the

Nursing Competency’, ‘recognizes the importance of integrated nursing’, ‘recognizes the improved the ability to handle emergency situations,’ and “recognizes the transformed the learning methods.”

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Results prove to be meaningful in that the research, rather than focusing on finding which factors contributed to nursing students’ experiences on simulated training and measuring the effects of specific learning methods, focused on the subjectivity of nursing students’ experiences in simulated training.

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