Relationships between the Objective Structured Clinical Examination, Depression Cognitive Scale, Self-Efficacy, and Problem Solving Strategies of Sophomore Nursing Students

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Abstract

Practical nursing training includes the learning of knowledge, skills, and attitude that are applied in clinical situations. The Objective Structured Clinical Examination (OSCE) method is an effective tool for evaluating the clinical nursing skills of nursing students. Depression is an important stress factor that can reduce academic achievement. However, self-efficacy with respect to the ability to provide patient care is vital for nurses who may be required to initiate treatments. The clinical field also requires that nurses use problem solving strategies (PSS) effectively. In this study, we conducted a survey to examine the relationship between the OSCE, Depression Cognitive Scale (DCS), self-efficacy (SE) and PSS in sophomore nursing students. We collected data data from 90 sophomore students at Namseoul University The data were analyzed using a t-test, ANOVA test, Mann-Whitney, Kruskal-Wallis, and stepwised multiple regression using SPSS 18.0. The stepwise multiple regression analysis shows that DCS(p=<.001), SE(p=.014), and PSS(p=.004) had significant effects on OSCE performance. Lower depression (B=-.164), higher self-efficacy (B=.025), and higher PSS (B=.071) appeared to be related to higher OSCE performance. DCS explains 64.3% of the total variation in OSCE, DCS and SE explained 66.3%. of the total variation and the addition of PSS increased this to 69.1%. Finally, the hit ratio of DCS, SE, and Pss was 69.1%.

Keywords: depression, objective structured clinical examination, self-efficacy

1. Introduction

In order to respond effectively and actively to rapidly changing public health environments, the nurses should be trained in the latest advances and must possess excellent skills [1, 2]. Thus, it is essential to combine nursing theory with practical training in the nursing curriculum. Practical training includes the learning of knowledge, skills, and attitudes that can be applied in clinical situations. To ensure that nursing education involves nursing activities in real patient situations, the majority of practical nursing training occurs in the hospitals rather than classroom. However, errors in patient care are not permitted during practical hospital so nursing students tend to lose motivation and confidence if they cannot demonstrate adequate nursing performance activity with patients and are refused access to patients because of their poor skills [3, 4]. Simulation-based education was emerging as alternative solutions to address this problem. Simulation-based education was developed by faculty members at the University of Southern California in the 1960s and spread throughout North America, Europe, and Asia

[5]. The main advantage of educational simulation is that the student becomes an active participant rather than a passive observer by applying the concept of a standardized patient (SP) [6]. The Objective structured clinical evaluation (OSCE) uses a SP and it is an objective method that captures the interaction between students and patients. OSCE comprises history taking, physical assessment, nursing performance, and an evaluation by professors. OSCE has been introduced widely in nursing education during recent years [7]. The OSCE method is an effective tool for evaluating the clinical nursing skills of student nurses. OSCE addresses various learning objective and assesses their achievement. At the same time, the interaction with patients during nursing activities gives a realistic experience to nursing students, and memories of successful practices can be stored in students' knowledge systems [8]. Thus, an appropriate evaluation of clinical performance is important for increasing clinical skills. Previous studies have shown that simulation-based learning using a SP improves the nursing skills [9], patient management ability [10], and self-efficacy (SE) of students [11]. However, depression was found to be the main mental health problem that affects nursing students. Clinical training is the most important part of the curriculum for nursing students because it allows them to engage in imagery and role play. However, clinical training is less useful if the students are experiencing depression and stress. A previous study showed that depression had a negative correlation with satisfaction during the clinical training [12]. Depression is very important stress factor that can reduce academic achievement [13]. Depression was reported to be an important factors that affects the nursing practice and academic achievement so it would be useful to investigate the relationship between depression and OSCE performance. SE is closely related to environmental factors, motivation and achievement [14]. The SE of nurses with respect to the ability to provide patient care is very important for nurses who may be required to initiate treatments. A student with low SE in various tasks may delay treatment initiation or avoid it altogether which may have adverse consequences for patients. The potentially adverse nursing performance effects of the SE of nurses means it is important to nurse educators to provide instruction that help students to estimate of their ability accurately [15]. However, the relationship between the SE and OSCE performance of nursing students is not fully understood. The clinical field also requires that nurses use problem solving strategies (PSS) effectively [16], because they will become the leading nurses of the future. Therefore, the present study conducted a survey to examine the relationship between the OSCE, and Depression Cognitive Scale (PSS), SE and PSS scores in sophomore nursing students. Additional basic data were also collected to help improve the clinical nursing skills of sophomore students.

2. Method

2.1. Design of the Research

This was a descriptive research that investigated the relationship between OSCE, DCS, SE, and PSS in sophomore nursing students.

2.2. Ethics

The study was approved by the Ethical Committee (Institutional Review Board) of Namseoul University.

2.3. Subjects

The study subjects were 90 sophomore nursing students at Namseoul University in Chungcheongnam-do. The students agreed to the purpose of the study and gave their informed consent to participate in the study.

2.4. Instruments

2.4.1. OSCE: A total of 15 items were specified for the OSCE used in this study, where the maximum score was 10 points and ability to perform Foley catheterization was tested.

2.4.2. DCS: DCS was developed by ZauszieWski and translated into Korean by Yeun, Kwon, and Kim [17]. The DCS comprises eight items and the scores ranged from 0 to 40 points. A lower score indicated severe depression. Cronbach's α was .93 in the original scale and .92 in the present study.

2.4.3. SE: SE scale was developed by Kim and Cha (1996) [18]. The SE questionnaire comprises 24 items in three subcategories: confidence, self-control efficacy, and task difficulty. The possible scores ranged from a minimum of 24 points to a maximum of 120 points where higher scores indicated good SE. Cronbach's α was .89 on the original scale and .74 in the present study.

2.4.4. PSS: PSS was developed from a checklist of mathematical PSS [19]. The PSS questionnaire comprised 20 items in three subcategories: spontaneity, task commitment, and confidence where the scores ranged from 0 to 20. Higher scores indicated that students had good PSS. Cronbach's α was .74 in the present study.

2.5. Data Collection

The data were collected between September 1 and September 30, 2012. The researchers explained the purpose of the study to the nursing students and obtained their informed consent. The students completed the questionnaire after performing Foley catheterization in the OSCE.

2.6. Data Analysis

This study was performed using data collected from 90 sophomore nursing students at Namseoul University. The data were analyzed using a t-test, ANOVA test, Mann-Whitney U test, the Kruskal Wallis test, and stepwise multiple regression with SPSS 18.0 software.

3. Results

3.1. General Characteristics

The demographic characteristics of the students are shown in Table 1.

The average age of the subjects was 21.07 years and 81% were female. The nurses reported their health status as: good 58.9%, moderate 28.9%, and poor 12.2%. Their satisfaction ratings were as follows: highly satisfied 52.2%, moderately satisfied 41.1%, and dissatisfied 6.7%. The mean scores and standard deviations in the evaluations were: OSCE=7.63±1.36, DCS=17.22±5.48; SE= 85.02±8.58; and PSS=12.54±3.56. The correlation analysis showed that OSCE had a significant negative relationship with DCS ($p<.001$) and positive relationships with SE ($p<.001$) and PSS ($p<.001$).

3.2. Relationships between the General Characteristics of Nurses and the DCS, SE, and PSS Results

Table 1 shows the relationships between the OSCE, DCS, SE, and PSS results and the general characteristics of the subjects.

The DCS score had a significant relationship with good health status (24.36±3.08, $p=<.001$), whereas poor health status students had a depressive tendency and higher DCS

scores than did good health status students, according to a post hoc Duncan's multiple range test. The mean SE score of students with a good health status was 88.40±8.49, which was significantly different from that of the students with a poor health status (76.82±4.09, *p*=<.001). The mean PSS score of the students with a good health status students was 13.58±2.73, which was significantly higher than that of the students with a poor health status (7.91±5.00, *p*=<.001), according to a post hoc Duncan's multiple range test. The mean DCS score of students who reported that they were highly satisfied was 5.28±4.21, which was significantly lower than that of the dissatisfied students (26.33±1.03, *p*=<.001). The mean SE score of the highly satisfied students was 88.40±8.49, which was significantly higher than that of the dissatisfied students (76.82±4.09, *p*=<.001). The mean PSS score of the highly satisfied students was 12.81±3.16, which was significantly greater than that of the dissatisfied students (5.67±4.50, *p*=<.001).

3.3. Effects of DCS, SE, and PSS on OSCE Performance

There was no multicollinearity between the independent variables because the variance inflation factor was <10.

The stepwise multiple regression analysis showed that DCS (*p*=<.001), SE (*p*=.014), and PSS (*p*=.004) had significant effects on OSCE performance. Lower depression (B=-.164), higher SE (B=.025), and higher PSS (B=.071) scores correlated with higher OSCE performance. DCS explained 64.3% of the total variation in OSCE. DCS and SE explained 66.3% of the total variation and the addition of PSS increased this to 69.1%. Finally, the hit ratio of DCS, SE, and PSS was 69.1%.

4. Discussion

The present study investigated the effects of DCS, SE, and PSS on OSCE performance by evaluating the Foley catheterization skills of sophomore nursing students during basic nursing practice training, according to the OSCE performance evaluation guidelines. Each part of the evaluation had a significant relationship with the DCS, SE, and PSS scores, according to the health status and satisfaction results. The OSCE performance and DCS score had a significant negative relationship. The highly satisfied students tended to be motivated and had higher academic achievement, and they participated in clinical training actively, because they were less depressive. A previous study of medical school students suggested that high satisfaction correlated with better clinical skills in the OSCE and Clinical Performance Examination. Nursing students experience considerable stress and anxiety before clinical training, which can lead to maladjustment in some [13]. They may feel nervous while performing unfamiliar medical procedures [20]. Stress and anxiety were identified as predictors of performance in previous studies. Thus, it was expected that there would be a negative correlation between the OSCE performance and depression. In the present study, lower depression (B=-.164) appeared to be correlated with higher OSCE performance and the DCS score explained 64.3% of the total variation in OSCE. A previous study also suggested that depressive nursing students were likely to have lower clinical skills performance [14]. Therefore, it is necessary to implement a psychoeducational program for nursing students. The present study showed that SE had a significant effect on the OSCE performance. Evaluation of personal ability affect the choices people make in many situations. SE is the belief in one's ability to take actions to manage a future situation [21]. This construct is of particular importance in practice disciplines such as nursing, where the acquisition of psychomotor skills is a critical component of student instruction because inaccurate SE assessment may lead to adverse patient outcomes [22, 23]. The SE and self-directed learning (SDL) are closely related, and it was reported that students with a higher SDL capacity performed better in learning

environments where they controlled the volume and style of SDL voluntarily [24]. A previous study of medical school students showed that SE was closely related to the OSCE performance and power of SE to explain the total variation in OSCE (66.3%) was similar to that determined in the present study. Thus, a higher SE is linked to better clinical performance. The SE of nursing students was the most important factor that affected their OSCE performance.

The PSS score had a positive relation with OSCE performance and it explained 69.1%of the variation (with DCS and SE). Nurses are confronted by many problems in hospitals and the correct identification of a patient problem means that it can be addressed appropriately [25]. The nursing process involves finding solutions and the PSS used in clinical practice have important roles in health care services. This study of the nursing process highlights the need for nurses with good PSS. The ability to apply PSS is a very important element of professional nursing practice. It is expected that professional nurses will be able to make effective decisions using PSS based on a strong knowledge base [16]. The importance of good PSS is supported by the results of the present study. The results showed that it is important to prepare and continuing education programs for PSS to enhance the clinical training performance of nursing students.

5. Conclusion

The results of this study show that we need to manage depression, SE, and PSS in students to increase their OSCE performance. These findings provide basic information that may help to improve OSCE performance. It is necessary to explore more efficient methods for increasing OSCE performance in broader areas of nursing education. It is also recommended that replicate studies should be conducted in this research area.

Table 1. Relationships between the General Characteristics of Nurses and the DCS, SE, and PSS

Variable	Category	n(%) Mean ±SD	Depression Cognitive Scale (DCS)			Self Efficacy (SE)		
			Mean ±SD	t/F/ Z/r	p	Mean ±SD	t/F/ Z/r	p
Gender	M	17(18.9)	16.82±6.88	-.832*	.406	85.00±10.02	2.681	.009
	F	73(81.1)	17.33±5.60			85.03±8.29		
Age		21.78±2.02		-.151	.154		.380	<.001
Score of OSCE		7.63±1.36		-.804	<.001		.458	<.001
Health status	Good	53(58.9)	14.09±3.97[a]	46.238	<.001 a<b<c	88.40±8.49[a]	14.595	<.001 a>b>c
	Moderate	26(28.9)	20.62±3.91[b]			81.62±6.30[b]		
	Poor	11(12.2)	24.36±3.08[c]			76.82±4.09[c]		
Major Satisfaction	Satisfaction	47(52.2)	15.28±4.21	19.332*	<.001	81.91±9.57	11.852	<.001
	Moderate	37(41.1)	18.24±5.63			70.54±13.17		
	Dissatis-faction	6(6.7)	26.33±1.03			74.00±11.26		
DCS		17.22±5.48					-.394	<.001
SE	total	85.02±8.58		-.394	<.001			
	confidence	25.17±3.60						
	self-control efficacy	42.91±5.73						
	task	15.97±2.68						

	difficulty						
PSS	total	12.54±3.56					
	spontaneity	3.77±1.73					
	task commitment	4.19±1.33		-.356	<.001	..175	.991
	confidence	4.77±1.49					

* Z value (Mann Whitney U test), ab: post hoc by Duncan's multiple range test, + χ^2 value (Kruskal Wallis test)

Table 1. Continue

Variable	Category	n(%) Mean ±SD	Problem Solving Strategies (PSS)		
			Mean ±SD	t/F/ Z/r	p
Gender	M	17(18.9)	12.41±4.08	-3.024*	.002
	F	73(81.1)	12.58±3.64		
Age		21.78±2.02		.188	.080
Score of OSCE		7.63±1.36		.460	<.001
Health status	Good	53(58.9)	13.58±2.73ᵃ	15.487⁺	.012 a>b
	Moderate	26(28.9)	12.38±2.83ᵃ		
	Poor	11(12.2)	7.91±5.00ᵇ		
Major Satisfaction	Satisfaction	47(52.2)	12.81±3.16	16.410	<.001
	Moderate	37(41.1)	13.32±2.69		
	Dissatis-faction	6(6.7)	5.67±4.50		
DCS		17.22±5.48		-.456	<.001
SE	total	85.02±8.58		.175	.099
	confidence	25.17±3.60			
	self-control efficacy	42.91±5.73			
	task difficulty	15.97±2.68			
PSS	total	12.54±3.56			
	spontaneity	3.77±1.73			
	task commitment	4.19±1.33			
	confidence	4.77±1.49			

* Z value (Mann Whitney U test), ab: post hoc by Duncan's multiple range test, + χ^2 value (Kruskal Wallis test)

Table 2. Effects of DCS, SE, and PSS on OSCE Performance (n=80)

	Step 1		Step 2		Step 3	
	B	B	B	β	B	β
Constant	11.019		8.513		7.438	
DCS	-.164	-.672***				
SE			.025	.010***		
PSS					.071	.188***
R^2(ΔR^2)	.643		.663(.024)		.691(.031)	
F	161.349		88.641		67.364	
p	<.001		<.001		<.001	

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