Impact of virtual ECG learning program on clinical judgement among baccalaureate nursing students

Prof. Jyoti*

PhD scholar, MMD University Mulana Haryana, Principal Government Medical College & Hospital, College of Nursing, Chandigarh India

Dr. Jyoti Sarin

Director, College of Nursing MMDU Mulana, Haryana

Abstract---Professional courses like nursing has integrated theory with practical learning and involves the decision making and clinical judgement. As the life is being handled therefore errors need to be zeroed, in order to acquire skill of the clinical judgement and retaining it can be done with help of virtual learning program (VLP) where case scenarios are created and life like situations are projected in front of the learner. This not only helps to decrease the threat to life also helps learner to gain confidence with immediate evaluation. Thus the study was conducted with objective to identify the impact of virtual ECH learning program on clinical judgement of baccalaureate students. Intervention (VLP) & Tools were developed and validated by the experts, tool included demographic profile, clinical judgement tool. Method of data collection was self-reporting, study participants were given access to the virtual learning program (VLP) on first day and their demographic profile and pre test was administered from day two to day six, study participants learnt from the VLP on ECG interpretation and on seventh day post test was administered followed by time series post tests on 15th as well as 30th day. Revealed that the clinical judgement was improved among experimental group (ANOVA 53.21), moreover it was retained as well ('t' value 21.23). Conclusion was drawn that VLP was effective and had impact on the clinical judgement.

Keywords---virtual ECG, earning program, clinical judgement, baccalaureate, nursing students.

Introduction

Virtual learning is defined as the delivery of learning through electronic mediation which bridges the gap caused when the instructor and student are separated in either time or place Traditional methods of teaching have always been focused on group and teacher centered and limited to a classroom, whereas the virtual learning has no limitation of space, time and solely student centred [1]. Clinical judgment is one of the key attributes of professional practice[2]. It is a prerequisite for establishing professional identity[3] and is mainly based on nurses' knowledge and experience as well as their reasoning, intuition, clinical thinking, and evidence-based practice skills[4,5]. Nurses use these skills to assess patients and the environment and to process and interpret patient information in order identify and fulfil patient needs[6]. This process results in the establishment of nursing diagnoses, effective clinical decision-making, problem solving and the improvement of care quality[7]. Tanner[6]noted that only professional nurses could go through this process. Such a structured approach to patient care is an important characteristic of structured professional judgment[8]. Professionalization[9] in clinical judgment is a major challenge of modern nursing[8]and despite its critical importance, it is still poorly understood.

Previous studies have explored and identified some of the main characteristics of nurses' professional practice, clinical judgment, and clinical decision-making. These characteristics included using knowledge and conceptual models in practice[10,11], adopting an interdisciplinary collaborative decision-making approach [10], including clinical judgment in nursing educational programs[12,13], and using evidence, intuition and autonomy[14]. Gerdeman et al.[12] noted that nurses' skilfulness is one of the main characteristics of professional nursing practice. Nurses' skilfulness pertains to their ability to use their skills in different situations. In other words, nurses' ability to use knowledge, experience and evidence, as well as their critical thinking skills in daily practice reflects their skilfulness in clinical judgment. The literature revealed that ECG a vital diagnostic tool, offers inseparable information regarding the diagnosis, prediction of risk and prognosis. Nurses when equipped with knowledge to interpret ECG can aid into saving lives and prevent unwanted complications. Moreover, a virtual learning program which can cater the learning needs, providing the freedom of self-paced learning, plays significant role in improving the clinical judgement. Therefore, investigator intents to examine the effect of virtual learning program on clinical judgement

Objectives of the study

- Assess and compare clinical judgement before and after the virtual learning program among baccalaureate nursing students
- Determine association of clinical judgement with selected variables among baccalaureate nursing students.

Material and Methods

Virtual learning program was developed and validated from Medical and nursing experts. Case scenarios were made as clinical judgement tool. Tools were also

developed based on available literature and expert's guidance and were validated as well. Reliability was assessed statistically and tools were found to be reliable. Difficulty index and discrimination index were also statistically calculated for each item of the tools which were found to be moderate. Study was conducted on baccalaureate second year nursing students, baseline data was collected with help pretest and two different nursing institutes were selected in urban area. User name and passwords were initially given by the investigator for first login which were later changed by the user as per their preference. After this investigator had no control over access and the progress of the study participants. Participants were provided five days for learning ECG through virtual learning program. Thereafter, time series data was collected at interval of 7 days, 15 days and 30 days. Data was analyzed according to the objectives of the study using descriptive and inferential statistics and is presented in the form of tables, graphs, and diagram.

Results

The data collected was tabulated. Coded and interpreted using spss software and was done by the blinded statistician. The socio demographic profile showed the following results.(refer table 1). Age of the study participants in experimental group was majorly in age of 19 (37.1%) to 20 years (40%) on other hand control group had majority participants of 21years (60%) and 60% of study participants were females in both experimental and control group.

Table1 Frequency distribution of socio demographic profile						N=70	
		EXP fr (%)	MEAN	SD±	CONTROL fr (%)	MEAN	SD±
Age in Years	i) 19 years	13(37.1%)	6.85	3.98	12 (34.3%)	6.33	2.96
	ii)20 years	14(40.0%)	5.86	4.45	0 (0.0%)		
	iii)21 years	5 (14.3%)	7.40	5.03	21 (60.0%)	4.24	2.96
	iv)22 years and above	3 (8.6%)	6.33	0.58	2 (5.7%)	6.50	0.71
Gender	Male	14 (40.0%)	5.86	4.05	14 (40.0%)	4.57	2.03
	Female	21 (60.0%)	6.90	4.11	21 (60.0%)	5.43	3.54
Percentage of previous year	51- 60%	11 (31.4%)	4.36	3.83	7 (20.0%)	5.00	2.38
	61-75%	21 (60.0%)	7.81	3.60	24 (68.6%)	5.08	3.31
	Above 75%	3 (8.6%)	5.00	5.57	4 (11.4%)	5.25	2.87
Have you ever been posted to Cardiac unit	Yes	24 (68.6%)	6.79	3.65	19 (54.3%)	4.81	2.43
	No	11 (31.4%)	5.82	4.98	16 (45.7%)	5.32	3.50
Father's Occupation	Others	32 (91.4%)	6.47	4.24	31 (88.6%)	4.90	3.16
	Health Care professional	3 (8.6%)	6.67	1.15	4 (11.4%)	6.50	1.00
Mother's Occupation	Others	32 (91.4%)	6.41	4.16	32 (91.4%)	5.06	3.12
	Health Care professional	3 (8.6%)	7.33	3.21	3 (8.6%)	5.33	2.08
Prior Knowledge about ECG interpretation	No	35 (71.4%)	6.00	4.39	28 (80.0%)	4.75	3.26
	Yes	10 (28.6%)	7.70	2.95	7 (20.0%)	6.43	1.13
Have you done	No	26 (74.3%)	6.23	4.36	32 (91.4%)	4.97	3.13

any online education before	Yes	9 (25.7%)	7.22	3.15	3(8.6%)	6.33	1.15

The percentage of previous year was 61-75% among both the experimental (60%)and control group 68.6%. Study participants who had their clinical postings completed were 68.6% in experimental group and in control group 54.3% had completed the posting. Participants' parents who belonged to health care profession were 8.6% among experimental group where as control group participants had father in health care profession (11.4%) and mothers who were health care professional were 8.6%. Prior knowledge was absent among the participants similarly, majority of participants of experimental group 74.3% and 32.96% in control group had not done nay online education related to the ECG interpretation (refer table 1)

Assess and compare clinical judgement before and after the virtual learning program among baccalaureate nursing students

Assessment of clinical judgement was found to be higher and improved after learning ECG from Virtual learning program. It was statistically proven, by calculating the percentage of cores among experimental and control group. In experimental group the clinical judgement level improved from average (before VLP 45.7%) to above average immediately after learning from the Virtual learning program, and it consistently remained above average even with the progression of time. The clinical judgment score on 7th day were above average among 85.7% and on 15th day as well it percentage of baccalaureate nursing students with above average score increased to 91.4% and it further increased to 94.3% (refer table 2). However in the control group it remained same of average scores.

Table 2
Comparison of Clinical Judgement level scores among Experimental and control group

N=70

VARIABLES	Score range	EXP Fr (%)	CONTROL Fr (%)
PRE Cl. Judgement	Below Average (0-17)	13 (37.1%)	19 (54.3%)
	Average (17-23)	16 (45.7%)	14 (40.0%)
	Above average(24-35)	6 (17.1%)	2 (5.7%)
Post Clinical Judgement 1 (Day 7)	Below Average (0-17)	3 (8.6%)	17 (48.6%)
	Average (17-23)	2 (5.7%)	14 (40.0%)
	Above average(24-35)	30 (85.7%)	4 (11.4%)
Post Clinical Judgement 2 (Day 15)	Below Average (0-17)	0 (0.0%)	21 (60.0%)
	Average (17-23)	3 (8.6%)	14 (40.0%)
	Above average(24-35)	32 (91.4%)	0 (0.0%)
Post Clinical Judgement 3 (Day 30)	Below Average (0-17)	0 (0.0%)	14 (40.0%)
	Average (17-23)	2 (5.7%)	21 (60.0%)
	Above average(24-35)	33 (94.3%)	0 (0.0%)

Table 3 Comparison of Mean score of Clinical Judgement between Experimental and control group

N=70

	PRE CJ (day 1)		POST 1 CJ (Day 7)		POST 2 CJ (Day 15)		POST CJ 3 (Day 30)	
	Exp grp	Ctrl grp	Exp grp	Ctrl grp	Exp grp	Ctrl grp	Exp grp	Ctrl grp
Mean	6.49	5.09	12.63	6.49	13.69	5.29	12.91	5.60
S.D.	4.061	3.023	3.059	3.175	1.891	1.742	1.502	1.376
T Test	1.636		8.243*		19.331*		21.238*	

*significant, $p < 0.05$

In order to statistically prove the impact of ECG virtual learning program Mean score comparison was done and result revealed that the t value was significant in all the post tests mean score (refer table 3). Interestingly the t value in the post test 3 was found to be highest (21.238), and thus inference was drawn that the clinical judgement kept on improving with time.

Table 4 Comparison of Mean score of Clinical Judgement with in Control group

N=70

CLINICAL JUDGEMENT	Mean		S.D		F Value	
	Exp	Ctrl	Exp	Ctrl	Exp	Ctrl
Pre-Clinical Judgement	6.49	5.09	4.061	3.023	53.21*	2.17
Post Clinical Judgement 1 (Day 7)	12.63	6.49	3.059	3.175		
Post Clinical Judgement 2 (Day 15)	13.69	5.29	1.891	1.742		
Post Clinical Judgement 3 (Day 30)	12.91	5.60	1.502	1.376		

df(3)$P < 0.05$

On assessment of the changes in clinical judgment with in the group using the on way ANOVA test revealed that the Virtual learning program brought the improvement in clinical judgement of the experimental group which is proven with significant ANOVA value 53.21.(refer table 4) On other hand in control group the ANOVA value was 2.17 (refer table 4) which is found to be not significant Therefore, conclusion was drawn that the VLP was effective and had impact on clinical judgement.

Determine association of clinical judgement with selected variables among baccalaureate nursing students

Table 5 Association of clinical judgement Score with Demographic variables (exp group)					
					N=70
Demographic Variables			Level of Scores		
Variables	Opts	Score Range (0-5)	Score Range (6-10)	Score Range (11-15)	x2
Age in Years	i) 19years	0	1	12	
	ii)20 years	0	1	13	0.632
	iii)21 years	0	0	5	
	iv) 22 years and above	0	0	3	
Gender	Male	0	1	13	0.088
	Female	0	1	20	
Percentage of previous year	51- 60%	0	0	11	
	61-75%	0	2	19	1.414
	Above 75%	0	0	3	
Have you ever been posted to Cardiac unit	Yes	0	2	22	0.972
	No	0	0	11	
Father's Occupation	Health Care professional	0	1	31	4.646
	Others	0	1	2	
Mother's Occupation	Health Care professional	0	2	30	0.199
	Others	0	0	3	
Prior Knowledge about ECG interpretation	No	0	1	24	0.477
	Yes	0	1	9	
Have you done any online education before	No	0	2	24	0.734
	Yes	0	0	9	
*significant, x2=df(3),7.81,p<0.05 , x2=df(2),5.99,p<0.05, x2=df(1),3.84,p<0.05					

In order to establish the fact that the virtual learning program was solely responsible for the changes in clinical judgement, association was calculated using chi square test. It was revealed that none of the socio demographic variable had significant chi square value. Hence the conclusion was outlined that the socio demographic variable did not affect the clinical judgement of experimental group participants. (refer table 5), it was only influenced or caused by Virtual learning program.

Conclusion

As statistical data showed significant difference between level of scores and mean scores of experimental and control group related to clinical judgement, it was concluded that Virtual learning program successfully helped the experimental group participants to improve the clinical judgement and it was retained as well

Acknowledgements

I would like to thank my guide for continuous support and guidance, without which this study wouldn't have been possible.

References

1. Leonard, B. (1996), "Distance learning: work and training overlap", HR Magazine, Vol. 4 No. 4
2. Kelly MA, Hager P, Gallagher R. What matters most? Students' rankings of simulation components that contribute to clinical judgment. J Nurs Educ. 2014;53(2):97–101.
3. Glick M. Clinical judgment: a requirement for professional identity. J Am Dent Assoc. 2011;142(12):1333–4.
4. Benner P, Tanner CA, CHesla CA. Expertise in Nursing Practice Caring, Clinical Judgment & Ethics.New York, NY 10036–8002: Springer Publishing Company, LLC; 2009. p. 47.
5. Tanner CA. Clinical judgment and evidence-based practice: toward pedagogies of integration. J Nurs Educ. 2008;47(8):335–6
6. Tanner CA. Thinking like a nurse: a research-based model of clinical judgment in nursing. J Nurs Educ. 2006;45(6):204–11
7. Pongmarutai T. Application of a judgment model toward measurement of clinical judgment in senior nursing students. Las Vegas: University of Nevada; 2010.
8. Falzer PR. Valuing structured professional judgment: predictive validity, decision-making, and the clinical-actuarial conflict. Behav Sci Law. 2013;31(1):40–54
9. Hoeve Y, Jansen G, Roodbol P. The nursing profession: public image, self-concept and professional identity. A discussion paper. J Adv Nurs. 2014;70(2):295–309.
10. Legare F, Stacey D, Gagnon S, Dunn S, Pluye P, Frosch D, et al. Validating a conceptual model for an inter-professional approach to shared decision making: a mixed methods study. J Eval Clin Pract. 2011;17(4):554–64.
11. Yaghoubi M, Javadi M, Rakhsh F, Bahadori M. A study of determining factors affecting the performance of nurses based on the achieve model in selected hospital of Isfahan (Iran). J Educ Health Promot. 2013;2:49.
12. Gerdeman JL, Lux K, Jacko J. Using concept mapping to build clinical judgment skills. Nurse Educ Pract. 2013;13(1):11–7.
13. Glynn DM. Clinical judgment development using structured classroom reflective practice: a qualitative study. J Nurs Educ. 2012;51(3):134–9.
14. Traynor M, Boland M, Buus N. Professional autonomy in 21st century healthcare: nurses' accounts of clinical decision-making. Soc Sci Med. 2010;71(8):1506–12.