

Clinical versus Video-Assisted Teaching Method on Nursing Students' Achievement Regarding Cranial Nerve Assessment

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Abstract

Background: Cranial nerve testing represents an essential part of neurological examination; it helps to identify neurological conditions and is useful for indicating any abnormal neurological disease processes. Therefore, *the aim of the study* was to evaluate the effects of clinical versus video-assisted teaching methods on nursing students' achievement regarding cranial nerve assessment. **Subjects and Method:** A quasi-experimental research design has been utilized and conducted on 2nd level B.Sc. Nursing students at Damietta University. A convenient sample was used in this study, comprised of 70 students, and was classified into two equal groups. Group I used the video-assisted teaching method, and Group II used the clinical teaching method. Two tools have been used in this research: tool I, the structured interviewing questionnaire, which consists of two sections: section I to assess demographic data and section II to assess students' knowledge regarding cranial nerve assessment. Tool II, a rubric for cranial nerve assessment, to assess students' competency level during cranial nerve assessment. **Results indicated** that there was a change in the students' knowledge and competency levels between the pretest and posttest in Group I, which used the video-assisted teaching method; also, a difference was observed between the pretest and posttest in Group II, which used the clinical teaching method. **Conclusion:** Both clinical and video-assisted teaching methods were effective in improving nursing students' achievement regarding cranial nerve assessment. But the clinical method was slightly more effective than the video-assisted teaching method in improving competency level. **Recommendation,** Clinical and video-assisted teaching methods are recommended to use for improving students' knowledge and competency level regarding cranial nerve assessment.

Keywords: Achievement, Cranial Nerve Assessment, Clinical teaching, Nursing Students, Video- assisted teaching.

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Introduction

Teaching and learning process is a transformation of knowledge from teachers to learners. This process involved many elements such as teaching strategy and how to implement, establishing learning objectives, developing resources of teaching and assessment methods (Munna & Kalam, 2021).

Cranial nerve testing represents an essential part of neurological examination, it helps to identify neurological conditions and useful for indicating any abnormal neurological disease processes (Reese, M Das, & Al Khalili, 2022). Teaching in nursing is a blend of both creative and intellectual aspects. Technical proficiency and teaching abilities had a great effect on how students learn well. An essential component of nursing education is clinical training, which gives students the chance to practice what they have learned while caring for patients, and help in shaping students' clinical skills needed for professional nursing practice (Sudha, 2013).

Videos are used in many educational settings based on the type of course, its objectives, its teaching strategies, and student's learning needs. Videos help student to learn, understand and give the opportunity to participate in a stimulating synchronous learning environment (Noetel, Griffith, Delaney, Sanders, Parker, et al, 2021).

Significant of the study

Clinical examination of cranial nerves is an integral part of nervous system assessment in patients, so that standard techniques should be used for adults. Newer teaching methods such as video-assisted and clinical teaching techniques are effective methods for better understanding and to facilitate long term learning. For practical skill learning sense of touch is essential and this can't be achieved through videos, but in clinical teaching teacher observes students and direct

and correct steps that students performed and can be repeated under direct supervision of teacher. Therefore, this study had applied to compare effectiveness of clinical versus video-assisted teaching on nursing students' achievement regarding cranial nerve assessment.

The aim of the study was to:

Evaluate clinical versus video-assisted teaching method on nursing students' achievement regarding cranial nerve assessment.

Research Hypothesis:

H1. There was an improvement into nursing students' achievement regarding cranial nerve assessment among nursing student using video-assisted teaching method.

H2. There was a difference into nursing students' achievement regarding cranial nerve assessment among nursing student using clinical teaching method.

H3. There was a significant difference between two teaching methods into nursing students' achievement regarding cranial nerve assessment.

Operational definition:

Nursing Students' achievement: refer to nursing student knowledge and competency level regarding cranial nerve assessment.

Method

Study Design: Quasi experimental was utilized in this study.

Setting: This study was conducted on 2nd level B.Sc. Nursing students at Damietta University.

Sample size: A convenient sample was used; subjects were selected through a non-probability sampling technique. Sample size consisted of 70 students, was classified into 2 equal groups. Group I was used video-assisted teaching method, and group II was used clinical teaching method.

Calculated through using G power program using the following data: effect size 0.8 α error prop

0.05, one tail, power (1-B err prop) 95% using independent t- test to detect difference between two independent means.

Tools and data collection:

The researchers used two tools in this research

Tool I: Structure interviewing questionnaire:

This tool created by researchers for gathering the necessary data and evaluates students' knowledge about cranial nerve, which divided into two parts;

Part I: Demographic data sheet

It included personnel data such as age, gender, economic status, area of coming, and place of stay during study.

Part II: Students Knowledge Questionnaire about Cranial nerve assessment

This tool was developed by the researchers, after reviewing related literature (Moyaa, Menéndez, Etessamb, Verac, & Fuertes, 2019) to assess general knowledge about cranial nerves. It consisted of 16 questions to assess origin of cranial nerve, names, types, longest nerve, shortest nerve, and function for each nerve.

The scoring system for this section items, was the correct answer received 1 mark while incorrect response received 0. After adding up the results, the final score was 16 (100%). Following that, score percentage was divided into the following categories;

Knowledge level	Percentage
Poor	<50%
Average	50%-75%
Good	>75%

Tool II: Rubric for Cranial Nerve Assessment

This tool was developed by the researchers after literature has reviewed (Nicholson, Gilli, & Dunning, 2009; Newman, 2020) to evaluate students' competency level during cranial nerve assessment. It involved 22 point to evaluate students' competency level during cranial nerve assessment. There were 4 competency levels which include unacceptable, need improvement, good and excellent.

Scoring system:

The response for each point consisted of either "Excellent" taken 4; "good" received 3, need improvement taken "2", and "unacceptable" taken 1. The score percentages were categorized as below;

Competency level categories	Percentage
Unacceptable	<50%
Need improvement	50% - < 75%
Good	75% - < 90%
Excellent	≥ 90 %

Validity of the tools: The validity of tools was tested by a jury of 5 staff members from Nursing and

Medicine Faculty Staff and any modification was made accordingly.

Reliability: was done using alpha cronbach's coefficient test. The alpha reliability for tool I; Part II (Students Knowledge Questionnaire) was 0.831 and tool II (Rubric for Cranial Nerve Assessment) was 0.846.

Pilot study: A pilot study was carried out on 10% of subjects before starting the data collection to test the tools for its relevance, feasibility, applicability, clarity and to determine the length of time needed to collect the data from each student. The tools modified according to results of pilot study.

Ethical considerations: Consent to conduct this study from Research Ethics Committee of Faculty of Nursing at Mansoura University was obtained with Reference No. (P. 0338).

Data collection extended over a period of four months from first of September to end of December 2022.

Field work: Frame work for this research passed with three phases, started with group I that using video-assisted teaching method then group II as the following:

Preparatory Phase: Started with researchers interviewing students, and explaining the aim of the study. Each student was interviewed individualized to collect baseline data and to assess student's knowledge and competency level regarding cranial nerve assessment. Each interview took approximately 15-20 minute.

Implementation phase: It was conducted through 2 sessions, each session taken 25-30 minute according to items that has been discussed with each session and attention span of students. Participants of each group were further subdivided into 5 groups of 7 each. Group I students had video- assisted demonstration of cranial nerve assessment, this video prepared by researchers; group II students had demonstrated cranial nerve assessment through clinical teaching method.

Practical and teaching sessions as well as assessment of competency level for both groups were conducted in clinical laboratory at Faculty of Nursing, Damietta University.

First session: teaching students about origin of cranial nerve, names of them, types, function of them, and how to assess each cranial nerve and steps of it.

Second session: demonstration about cranial nerve assessment according to teaching method for each group.

Evaluation phase: After 1-week post test has been done for both groups through using (tool I part II, and tool II) to determine effect of both teaching methods on nursing student's knowledge and competency level regarding cranial nerve assessment.

Statistical analysis: The collected data were revised then analyzed, coded and fed to the computer and analyzed using IBM SPSS software package version 26.0. (Armonk, NY: IBM Corp). Qualitative data were described using number and percent. Quantitative data

were described using range (minimum and maximum), mean, standard deviation and median. Significance of the obtained results was judged at the 5% level. Independent t-test, used for normally distributed quantitative variables, to compare means between two studied groups. Chi square test (χ^2) used to test the association between the categories of two independent samples. The spearman correlation coefficient (rho) is expressed as the Pearson coefficient. The sign of the coefficient indicates the nature of relation (positive/negative) while the value indicates the strength of relation as follow: Weak correlation for rho less than 0.25, intermediate correlation for rho of value between 0.25-0.74 and strong correlation for value between 0.75 - 0.99.

Results

The collected data were analyzed statistically and the results are categorized as following parts;

Table (1): Demographic characteristics of the study participants (N = 70)

Regarding this table, there wasn't a significant difference in demographic characteristics between the clinical group and the video-assisted teaching group. In both groups, the average age was between 19 and 20 years old (82.9%). Female participants were well represented (80% and 71.4% in groups I and II, respectively). Moreover, 62.9% and 80% of groups I and II came from rural areas. Moderate economic status is represented (82.9% and 91.4%) in groups I and II, respectively. The students stay during study in Group I represented 94.3% and 100% in Group II at home.

Table (2): Comparison of student's knowledge score on both groups before and after using two different teaching methods (N= 70):

This table showed no significant difference into student's knowledge in group I and group II through using video-assisted and clinical teaching. The mean standard for pre test in group I was 8.485 ± 2.627 and the post test mean \pm SD was 12.714 ± 1.690 . About group II, the mean \pm SD for pre test was 8.771 ± 2.509 while post test Mean \pm SD was 13.142 ± 1.665 .

Figure (1): Difference of pre and post test total knowledge levels in video-assisted teaching and clinical teaching group (N=35 for each group):

According to this figure, there was a difference into student knowledge levels about cranial nerve in both groups between pre, and post test through using video-assisted and clinical teaching methods.

Table (3): Comparison of student's Competency Score on both groups before and after using two different teaching methods (N= 70):

There was a significant difference into competency level between two groups in post test where p value was found (0.000). Concerning the mean standard for pre test in group I was 29.657 ± 6.628 and the post test mean \pm SD was 62.685 ± 10.518 . About group II, the mean \pm SD for pre test was 29.857 ± 6.664 while post test Mean \pm SD was 76.600 ± 5.499 . But slightly more competency improvement was observed into clinical teaching group.

Figure (2): Distribution of pre and post test total Competency levels in video-assisted teaching and clinical teaching group (N=35 for each group):

This figure illustrated that there was a difference into student competency levels about cranial nerve in both groups between pre, and post test through using video-assisted and clinical teaching methods.

Table (4): Correlation coefficient between student's knowledge and competency pre and post into two groups (N= 35 for each group):

This table illustrated a significant correlation between students' knowledge and competency pre and post test in both groups using video-assisted teaching or clinical teaching method where p value was found to be (p= .000).

Table 1: Demographic characteristics of the study participants (N = 70):

Items	Teaching Method					
	Video – assisted [Group I]		Clinical teaching [Group II]		Significance test	
	No (35)	%	No (35)	%	X ²	P
Age group						
18-19 year	6	17.1	5	14.3	1.091	.580
19-20 years	29	82.9	29	82.9		
>20			1	2.9		
Gender						
Male	7	20	10	28.6	.699	.403
Female	28	80	25	71.4		
Area of coming						
Rural	22	62.9	28	80	2.520	.112
Urban	13	37.1	7	20		
Economic-status						
Low	6	17.1	3	8.6	1.148	.284
Moderate	29	82.9	32	91.4		
Place of stay during study						
Home	33	94.3	35	100	2.059	.151
Hotel	2	5.7	0	0		

- Count [Percent] and p value (X² value) through Chi-square test.

Table 2: Comparison of student's knowledge score on both groups before and after using two different teaching methods (N= 70).

	Teaching Method			
	Video - assisted [Group I (N=35)]	Clinical teaching [Group II (N= 35)]	Significance test	
	Mean ± SD	Mean ± SD	t. value	P
Pre test	8.485 ± 2.627	8.771 ± 2.509	0.465	0.643
Post test	12.714 ± 1.690	13.142 ± 1.665	1.069	0.289

▪ T. Independent- Samples T Test

*Significant at $P \leq 0.05$

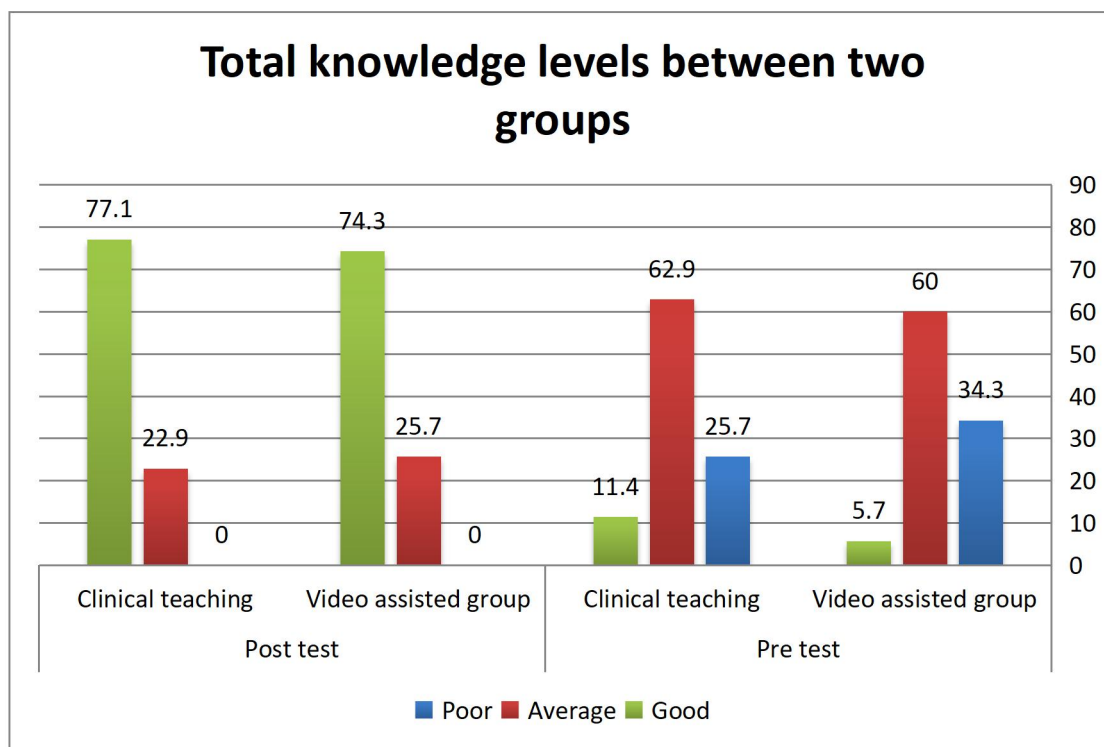


Figure 1: Difference of pre and post test total knowledge level in video-assisted teaching and clinical teaching group (N=35 for each group)

Table 3: Comparison of student's Competency Score on both groups before and after using two different teaching methods (N= 70).

	Teaching Method			
	Video - assisted [Group I (N=35)]	Clinical teaching [Group II (N= 35)]	Significance test	
	Mean ± SD	Mean ± SD	t. value	P
Pre test	29.657 ± 6.628	29.857 ± 6.664	0.126	0.900
Post test	62.685 ± 10.518	76.600 ± 5.499	6.935	0.000**

▪ T. Independent- Samples T Test

*Significant at P ≤ 0.05

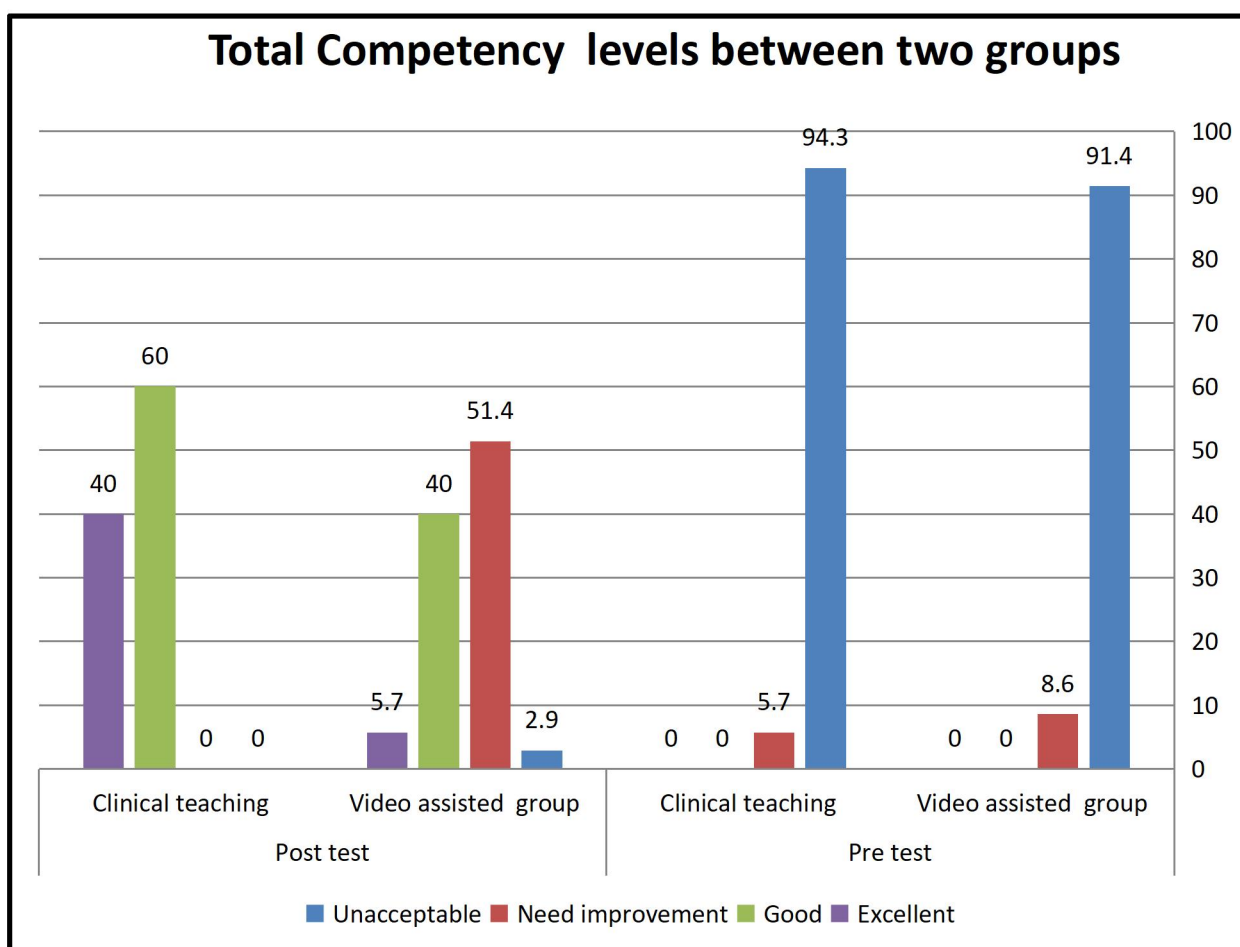


Figure 2: Distribution of pre and post test total Competency level in video-assisted teaching and clinical teaching group (N=35 for each group)

Table (4): Correlation coefficient between student's knowledge and competency pre and post into two groups (N= 35 for each group).

Parameter	Video - assisted [Group I (N=35)]		Clinical teaching [Group II (N= 35)]	
	R	P	R	P
Students knowledge and competence level (pre test)	.689*	.000	.877**	.000
Students knowledge and competence level (post test)	.683**	.000	.796**	.000

▪ R: Pearson correlation coefficient

*Significant at $P \leq 0.05$

Discussion

Using innovative educational methods in the process of medical education has led to favorable results in many countries. Different educational methods for medical students, such as group discussion, clinical teaching, video-assisted teaching, lectures, problem solving, medical-based simulation, and E-learning, could be used (Ataei, Hamedani, & Zameni, 2020). The most important part of a complete neurological examination is cranial nerve examination. The skills of applying neurological examination are considered challenging to learn by medical students and junior clinicians (Damodaran, Rizk, Rodriguez, & Lee, 2014).

In terms of demographic data, more than three-quarters of participants in both groups were between the ages of 19 and 20, which is consistent with the findings of (Latha, Prakash, & Lobo, 2011) who discovered that most participants were between the ages of 19 and 20, and (Jamnik, 2018) who discovered that less than two-thirds were between the ages of 18 and 21. Female participants represented the majority of the study sample in both groups; this is in line with (Jamnik, 2018) who mentioned that the largest proportion was female.

Regarding area of residence, the largest proportion of study participants in both groups comes from rural areas, in contrast with Jamnik (2018), who reported that half of participants belong to rural areas and the other half belong to urban areas. About economic status, more than three-quarters of the study participants in both groups have a moderate economic level. The largest proportion of the sample in both groups stays at home during study; this may be related to their moderate income level, which makes it unsuitable for them to stay in hotels during study.

In relation to the students' knowledge, there was an improvement in their knowledge levels between the pre and post test in Group II, which used clinical teaching. Also, students' knowledge levels differ between the post test and the pre test in group I, which uses video-assisted teaching. In consistency with (Prabhu, 2013) who proved that there was a difference in levels of knowledge between pre and post test when

using video-assisted teaching methods, this may be because video-assisted teaching helps to retain memory and is suitable for both auditory and visual learners. Also (Pillai & Sundeep, 2022) reported that both video-assisted and demonstration is effective in learning students about cranial nerves and their marks improved after using both techniques. On the other hand, (Roshini & Andrews, 2019) reported that the post test scores were not improved by the video-assisted teaching as compared with the demonstration method, indicating that traditional demonstration has an impact that is noninferior to video- assisted teaching in improving the skill.

In the present study, there was an improvement into competency levels of students in both groups between pre and post test. This goes in line with (Prabhu, 2013) who proved that there was an improvement into student's skills levels after using video- assisted teaching, in the same point (Parwanda, Naveena, Verma, & Sharma, 2016) who illustrated that video-assisted teaching is an effective in improving knowledge and skills of students.

Also there was a significant difference into competency levels post test between two groups, and clinical teaching was slightly more effective than video-assisted teaching, this results is in agreement with (Gawai, & Rawekar, 2016) who revealed that the competency level of nursing student, showed that clinical teaching is more effective than video-assisted teaching.

In additional to (Parwanda, Rajani, Malar, Chacko, Choudhary, *et al.*, 2014) who mentioned that demonstration method improves practice than video- assisted teaching. This may due to learning by donning is more effective, students acquire practical experience and skills only by perform procedure in life situation.

In contrast (Scaria, Valsaraj, & Pias, 2013) who reported that learners experience is made real in educational videos by combining, sight and sound together and efficacy of video teaching over lecture cum demonstration in improving knowledge and skill of students.

Concerning correlation between student's knowledge and competency level in both groups,

a significant correlation has been found between student's knowledge and skills; this is in consistency with (Pandey, & Kumar, 2019) who mentioned that there was a significant correlation between student's knowledge and skills.

Conclusion

The findings of this study showed that both clinical and video-assisted teaching methods were effective for improving student's knowledge and competency levels, and clinical teaching is slightly more effective for improving competency level than video-assisted teaching method.

Recommendation

- An identical study may be applied to a large sample to generalize results.
- Further research with multiple teaching methods can be conducted to validate them.
- Research may be conducted to evaluate the attitudes of students towards the teaching methods used in their collages.
- Research to evaluate teaching and learning resources that were needed in the teaching and learning process.

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References

- Ataei, M., Hamedani, S., & Zameni, F., (2020): Effective methods in medical education from giving lecture to simulation. *Journal of Advanced Pharmacy Education & Research*. 10(S1):36-42.
- Damodaran, O., Rizk, E., Rodriguez, J., & Lee, G., (2014): Cranial nerve Assessment: A concise Guide to Clinical Examination. *Clinical Anatomy*. 27(1): 25-30. doi: 10.1002/ca.22336.
- Gawai, J., & Rawekar, A., (2016): Efficacy of two different methods of teaching on students' competencies in performing nursing procedure among undergraduate nursing students. *Global journal for research analysis analysis*. 5(9): 234:236.
- Jamnik, V.D., (2018): Effectiveness of Lecture Cum Demonstration Method on Knowledge and Skill Regarding Cranial Nerve Assessment among Under Graduate Nursing Student in Selected Nursing College. *International journal of science and research*. 8 (7): 1519-1523. ISSN: 2319-7064.
- Latha, T., Prakash, R., & Lobo, D., (2011): Effectiveness of two teaching methods for cranial nerve assessment. *International Journal of Nursing Education Scholarship*.3(2):65-69.
- Moyaa, M. J., Menéndez, S. M., Etessamb, J. P., Verac, J. E., & Fuertes M. Y., (2019): Cranial nerve disorders: Clinical manifestations and topography. *Radiologia*. 61(2):99-123. doi: 10.1016/j.rx.2018.09.005.
- Munna, A., & Kalam, M., (2021): Teaching and learning process to enhance teaching effectiveness: a literature review. *International journal of Humanities and innovation*.4 (1):1-4.
- Newman, G., (2020): Neurological examination, how to assess the cranial nerves. Available at <https://www.msmanuals.com/professional/neurologic-disorders/neurologic-examination/how-to-assess-the-cranial-nerves>. Accessed at 4/4/2023.
- Nicholson, P., Gillis, Sh., & Dunning, A.M.T., (2009): The use of scoring rubrics to determine clinical performance in the operating suite. *Nurse Education Today*.29:73-82.
- Noetel, M., Griffith, S., Delaney, O., Sanders, T., Parker P., Cruz, B., & Lonsdale, C., (2021): Video Improves Learning in Higher Education: A Systematic Review. *Rev. Educ*. 91: 204–236. [CrossRef].
- Pandey, A., & Kumar, V., (2019): Evaluate Effectiveness of Lecture using Power Point on knowledge and skill regarding Cranial Nerve assessment among B.Sc. Nursing Students. *International Journal of Nursing Education and Research*.7 (2):258-260. DOI: 10.5958/2454-2660.2019.00057.
- Parwanda, G., Naveena, J H., Verma, A., & Sharma, A., (2016): Effectiveness of video assisted teaching on knowledge and practices regarding personal hygiene among primary school children of urban government school. *International Research Journal of Human Resources and Social Sciences*. 3(6):113-119.
- Parwanda, G., Rajan, J., Malar, A., Chacko, N. P., Choudhary, P., & Andrews, S., (2014). Effectiveness of Video Assisted Teaching vs Demonstration Method on Female Urinary Catheterization in Terms of Knowledge and Practice. *International Journal of Nursing Care*, 2(1), 13.
- Pillai, S., & Sundeep, S., (2022): Assessment of Learning Readiness and Usefulness of Newer Medical Education Techniques in teaching Cranial nerve examination in Children and Adults - A Prospective Study Conducted in a Tertiary Medical College Hospital in India. *YMER*. 21(22):1420-1432. ISSN: 0044-0477.
- Prabhu, S., (2013): Comparison of traditional versus video based teaching on neurological assessment among undergraduate nursing students. *Nitte university journal of health science*.3(2):29-32.
- Reese, V., M Das, J., & Al Khalili, Y., (2022): Cranial nerve testing. *StatPearls [Internet]*. Treasure Island (FL). Available at <https://www.ncbi.nlm.nih.gov/books/NBK58506/>.
- Roshini, N., & Andrews, MA., (2019): Effectiveness of video-assisted teaching program and traditional

demonstration of mechanism of labor on undergraduate medical students. *International Journal of Medical Science and Education*. 6(4):72-76. pISSN- 2348 4438 | eISSN-2349-3208.

Scaria, T. M., Valsaraj, P. B., & Pias, M., (2013).

The effectiveness of video teaching over lecture cum demonstration in improving knowledge and skill, of nursing students on antenatal examination. *International Journal of Nursing Education*, 5(1),228. Available from: <http://www.indianjournals.com/ijor.aspx?target=i-jor:ijone&volume=5&issue=1&article=048>.

Sudha, R., (2013): Nursing education: principles and concepts, Jaypee brothers medical publisher, First edition: 252-257. ISBN 9789350253793. doi 10.5005/jp/books/11730.