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EFFECTIVENESS OF STRUCTURED TEACHING PROGRAM ON THE KNOWLEDGE AND PRACTICE OF ERGONOMICS AMONG SELECTED OPERATION THEATRE NURSES

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ABSTRACT

"A study to assess the effectiveness of structured teaching program on knowledge and practice of ergonomics among selected operation theatre nurses in selected hospitals of Pune city." The objectives were: a) To assess the knowledge and practice of ergonomics among selected operation theatre nurses before a structured teaching program, b) To assess the knowledge and practice of ergonomics after giving the structured teaching program, c) To compare the knowledge and practice of ergonomics before and after the structured teaching program,d) To associate the findings to selected demographic variables with the level of knowledge and practice of ergonomics. In this quantitative approach, a pretest post test control group design was used for 60 samples using purposive sampling technique. A structured questionnaire and an observation checklist were prepared to assess the knowledge and practices. On the first day, following the assessment of knowledge and practice, a planned teaching was given and post test was conducted after a period of 5 days to the experimental group. Findings revealed that the average knowledge score in pretest of the experimental group was 6.6 which increased to 14.1 in posttest.Average practices score in pretest was 3.5 which decreased to 1.9 in posttest. Conclusion: Structured teaching program on ergonomics was found to be significantly effective in improving the knowledge and practices of nurses working in operation theatre.

INTRODUCTION

Nursing profession within the health care sector is focused on the care of individuals, families and communities to attain maintain or repose optimal health and quality of life. Nursing profession is established as a physically and psychologically demanding profession with high prevalence rates of musculoskeletal complaints.[1]

Skills needed to care for clients often require physical strength to provide individuals with assistance required to remain mobile. Nurses/caregivers may need to carry, pull, push or lift clients and equipment to accomplish daily care. It is imperative to know and use proper ergonomic techniques and seek assistance as needed to avoid injury to self and others.[2]

As an Operation Theatre nurse is a member of the surgical team; their role is to plan and perform certain tasks on their own but most work occurs in interaction with the team. Certain medical interventions are performed either sitting or standing.

LITERATURE SURVEY

Hartingsen J, *el at*, conducted a study to evaluate the effectiveness of an intensive educational and low tech ergonomic intervention programme aimed at reducing low back pain (LBP) among the 345 home care nurses and nurses' aides in four Danish municipalities. Participants in two municipalities constituted the intervention group and those in the other two served as controls. In the intervention group, participants were divided into small groups, each of which was assigned one specially trained instructor. During weekly meetings, participants were educated in body mechanics, patient transfer and lifting techniques, and use of low tech ergonomic aids. In the control group, participants attended an overtime only three hour instructional meeting. Information on LBP was collected using the standardised Nordic questionnaire supplemented with information on number of episodes of LBP and care-seeking due to LBP during the past year. A total of 309 nurses and nurse aides returned the questionnaire at baseline and 255 at follow-up in August 2001. At follow-up, significant differences were found between the two groups for the LBP variables, and both groups thought that education in patient transfer techniques had been helpful. [3]

A survey was conducted among 23 nursing professionals in the healthcare industry about their training, practices, and challenges related to ergonomics. The survey included questions about job-related injuries, safe practices, training, workplace safety, and attention given by administration to

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these increasingly crucial matters. The biggest challenge among those surveyed (mostly nurse managers and senior nurse executives) was getting staff nurses to follow proper procedures. When asked about the relationship between ergonomics and turnover, most respondents felt that ergonomics was not an influential factor in staff turnover at their facility. Furthermore, 70% of respondents felt that there was adequate support from senior-level executives in making the necessary improvements that lead to an ergonomically sound workplace. According to the results, the majority of respondents (61%) said that less than 10% of their nurses complain of back pain/injuries each year. Furthermore, 65% of respondents said that less than 10% of their nurses miss a day of work each year due to chronic back pain or other on-the-job injuries. None said it happens to more than 50% of their nurses, whereas 34% of respondents were in the 10%–50% range. Of the nagging injuries other than back problems that do draw complaints or force employees to miss work, tendonitis was the most common, drawing 36% of the 11 responses to this question. Carpal tunnel syndrome was second with 27% of the responses. The importance of ergonomics in the workplace continues to grow as the nursing shortage and staff burnout are increasingly finding the healthcare spotlight. The data from this report shows that although positive steps are already being taken at many facilities, on-the job injuries, poor training, and poor techniques are having a detrimental effect on the workplace—at both large and small organizations. Although turnover is not greatly related to ergonomics, worker health and satisfaction are closely tied to these conditions. [4]

MATERIAL AND METHODS

The research approach adopted for this study was of Quantitative Approach. The research design was a Quasi Experimental Pre test-post test Control group design. A Non probability purposive sampling technique was used to select the samples. The sample for the study comprised of 60 nurses working in the operation theatre. There were 30 Nurses in the control group and 30 Nurses in the experimental group. Nurses working with minimum one year of experience in the Operation Theatre were included in the study. Both Male and Female Staff Nurses are included for the study. Nurses having previously diagnosed with Severe Musculo-skeletal disorders and under treatment were excluded from the study. Prior permission was obtained from respective hospitals. The purpose of the study was explained to the participant in the study, confidentiality of their response was assured and formal consent will be taken. Pre test was done on the first day of intervention using a Rapid Entire Body Assessment Observational Checklist for assessing the Practice of Ergonomics. Pre test was conducted using a structured questionnaire related to the knowledge and practice of Ergonomics. A Structured Teaching Program on Knowledge and Practice of Ergonomics was administered to the experimental group. Approximately 20-30 minutes was spent for intervention. Post test was done after 5 days of intervention using Rapid Entire Body Assessment Observational Checklist for evaluating the Practice of Ergonomics and using a questionnaire related to the knowledge and of Ergonomics. The tools were prepared and distributed to a group of 19 experts for validity in different educational institutions and health centres across Pune city. The expert suggestions and remarks were taken towards positive implementation for tool construction. Reliability of the tool was checked on six operation theatre staff nurses. Test-Retest Method for assessing the reliability of Structured Questionnaire and using Inter-rater method for Observational Checklist .which Karl Pearson's Co-efficient Co-relation test was used. Karl Pearson's correlation coefficient was found to be 0.93 which proved that Structured Questionnaire was reliable and Cohen's Kappa test score was found to be 0.71 which suggested that Observational Checklist was reliable. The pilot study was conducted in Pune Adventist Hospital, Pune one week prior to actual data collection to find the feasibility of the study. Six operation theatre staff nurses were selected for the pilot study. The operation theatre nurses possessed the same characteristics as that of the sample for the final study, but were not included in the main study. The time and cost of the study was within the limit. It was found feasible to conduct the study.

Statistical Analysis

The data was analysed to assess the effectiveness of structured teaching program on ergonomics among selected operation theatre nurses in selected hospitals of Pune city.The data was collected and analysed on the basis of objectives of the study in the following ways;

Section I deals with the description of samples working in the operation theatre based on their demographic variables.

Section II has the analysis of data related to knowledge and practice of ergonomics among nurses working in the operation theatre before giving the structured teaching program.

Section III has the analysis of data related to knowledge and practice of ergonomics among nurses working in the operation theatre after giving the structured teaching program.

Section IV has the analysis of data related to comparing the effectiveness of structured teaching program on knowledge and practice of ergonomics among selected operation theatre nurses.

Section V has the analysis of data related to association of knowledge and practices regarding ergonomics of nurses with their demographic variables.

Section I: Description of samples working in operation theatre based on the demographic variables.

Section II: Analysis of data related to knowledge and practice of ergonomics among nurses working in the operation theatre before giving the structured teaching program.

The data presented in Table 2a of 60 samples selected, the pretest analysis shows that 70% of the nurses working in operation theatre had poor knowledge, 26.7% of them had average knowledge and 3.3% of them had good knowledge regarding ergonomics in experimental group. In control group, 50% of the nurses working in operation theatre had poor knowledge, 43.3% of them had average knowledge and 6.7% of them had good knowledge regarding ergonomics. The data presented in Table 2b of 60 samples selected, the pretest analysis shows that 63.4% of the nurses in experimental group had medium risk, 33.3% of them had low risk and 3.3% of

them had negligible risk. 76.7% of the nurses in control group had medium risk, 13.3% of them had low risk and 10% of them had negligible risk.

Table 1 Demographic characteristics of the study samples: N= 60

Sr. No.	Demographic variable	Control (N=30)		Experimental (N=30)	
		Freq	%	Freq	%
1	**Age (In years)**				
	Below 30	19	63.3%	21	70.0%
	31 – 40	11	36.7%	7	23.4%
	41 – 50	0	0.0%	1	3.3%
	51 – 60	0	0.0%	1	3.3%
2	**Gender**				
	Male	8	26.7%	12	40.0%
	Female	22	73.3%	18	60.0%
3	**Height (In Meters)**				
	1.2-1.5 Meters	4	13.3%	3	10.0%
	1.51-1.8 Meters	26	86.7%	27	90.0%
4	**Weight (In Kilograms)**				
	Between 40 – 50 Kg	8	26.7%	4	13.3%
	Between 51 – 60 Kg	8	26.7%	5	16.7%
	Between 61 – 70 Kg	11	36.6%	11	36.7%
	Above 70 Kg	3	10.0%	10	33.3%
5	**Years of Experience**				
	Between 1 – 9 Years	22	73.3%	21	70.0%
	Between 10 – 18 Years	8	26.7%	8	26.7%
	Between 19 – 27 Years	0	0.0%	1	3.3%
6	**Area of Work Experience**				
	Operation Theatre	30	100.0%	30	100.0%
7	**Educational Qualification**				
	Diploma in Nursing	23	76.7%	26	86.7%
	Degree in Nursing	7	23.3%	4	13.3%
8	**Additional Course Attended**				
	ACLS, BLS, I.C.N	1	3.3%	0	0.0%
	Any other, Please Specify	0	0.0%	0	0.0%

Table 2a Pretest Knowledge Scores

N= 60

Sr. No.	Knowledge	Experimental Group (N= 30)		Control Group (N- 30)	
		Pre Test Score		Pre Test Score	
		Freq	%	Freq	%
1	0-7	21	70.0%	15	50.0%
2	8-14	8	26.7%	13	43.3%
3	15-21	1	3.3%	2	6.7%

Score: 0-7= POOR; 8-14= AVERAGE; 15-21= GOOD

Table 2b Pretest Practice Scores

N= 60

Sr. No.	Practice of Ergonomics	Experimental Group (N= 30)		Control Group (N= 30)	
		Pre test		Pre test	
		Freq	%	Freq	%
1	Negligible Risk	1	3.3%	3	10.0%
2	Low Risk	10	33.3%	4	13.3%
3	Medium Risk	19	63.4%	23	76.7%
4	High Risk	0	0.0%	0	0.0%
5	Very High Risk	0	0.0%	0	0.0%

Section III: Ananalysis of data related to knowledge and practice of ergonomics among nurses working in the operation theatre after giving the structured teaching program.

Table 3a: Post test knowledge scores. N= 60

Sr. No.	Knowledge	Experimental Group (N= 30)		Control Group (N= 30)	
		Post test		Post test	
		Freq	%	Freq	%
1	0-7	3	10.0%	26	86.7%
2	8-14	10	33.3%	4	13.3%
3	15-20	17	56.7%	0	0.0%

Score: 0-7= POOR; 8-14= AVERAGE; 15-21= GOOD

The data presented in Table 3a of 30 samples selected in experimental group, the posttest showed that 56.7% of them had good knowledge, 33.3% of them had average knowledge and 10% of them had poor knowledge regarding ergonomics. This indicates that there is remarkable improvement in the knowledge of the nurses after structured teaching program. In control group, the posttest showed 86.6% of the nurses working in operation theatre had poor knowledge and 13.3% of them had average knowledge regarding ergonomics. This indicates that the knowledge of nurses in control group did not improve. This again implies that without structured teaching program, the knowledge of nurses regarding ergonomics did not improve.

Table 4a An average change in the knowledge of ergonomics among nurses working in the operation theatre in the experimental group. **N=30**

	Mean	SD	t	df	p-value
Pretest	6.6	2.6	13.2	29	0.000
Posttest	14.1	3.8			

The data presented in Table 4a shows that the average knowledge score in pretest was 6.6 which increased to 14.1 in posttest. Therefore, the observed value of t for this comparison was 13.2 with 29 degrees of freedom as corresponding p-value was 0.000 (which less than 0.05).

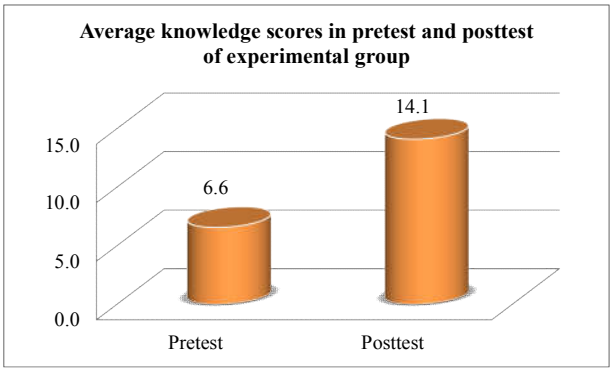

Figure 5a Shows the average Pre test and Post test knowledge scores of Nurses in Experimental group.

Table 4b Average change in practices of Ergonomics among Nurses working in the Operation theatre in the experimental group **N=30**

	Mean	SD	t	df	p-value
Pretest	3.5	0.8	15.5	29	0.000
Posttest	1.9	1.0			

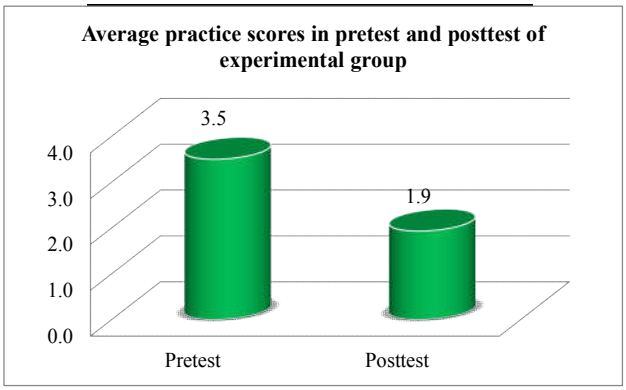

Figure 5b Shows the average Pre test and Post test practice scores of Nurses in Experimental group.

The data presented in Table 4b shows that the average knowledge score in Post test was 3.5 which decreased to 1.9 in posttest. Therefore, the observed value of t for this comparison was 15.5 with 29 degrees of freedom as corresponding p-value was 0.000 (which less than 0.05).

Section IV: Analysis of data related to comparing the effectiveness of structured teaching program on knowledge and practice of ergonomics among selected operation theatre nurses.

Table 5a Knowledge gain in experimental and control group N=60

Group	Mean	SD	t	df	p-value
Exp	7.5	3.1	11.8	58	0.000
Control	-2.7	3.6			

The data presented in Table 5a shows the comparison of knowledge among nurses regarding ergonomics in experimental and control group. The Researcher has applied two sample t-test for comparison of the knowledge scores in both the groups. The average gain in knowledge score present in experimental group was 7.5 which is -2.7 for control group. Therefore, the observed t-value for this comparison was 11.8 with 58 degrees of freedom rejected as corresponding p-value was 0.000 which is small (less than 0.05) and we can conclude that structured teaching program on ergonomics was found to be significantly effective in improving the knowledge on ergonomics of the nurses working in operation theatre.

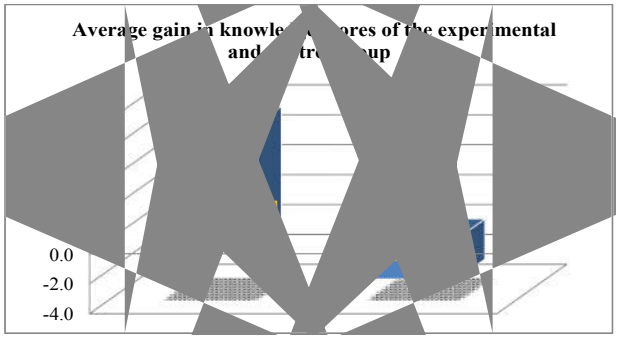

Figure 6a: Shows the average gain in knowledge scores of Nurses in the Experimental group and Control group.

Table 5b Improvement in Practices among nurses in the experimental and control group

N=60

Group	Mean	SD	t	df	p-value
Exp	1.6	1.1	3.1	58	0.001
Control	0.3	1.9			

The above Table 5b shows the comparison of practices among nurses regarding ergonomics in experimental and control group. The Researcher has applied two sample t-test for comparison of the improvement in practices in both the groups. The average improvement in practice score in experimental group was 1.6 which was 0.3 for control group. Therefore, the observed t-value for this comparison was 3.1 with 58 degrees of freedom as corresponding p-value was 0.000 which is small (less than 0.05) and we can conclude that structured teaching program on ergonomics was found to be significantly effective in improving the practices on ergonomics of the nurses working in operation theatre.

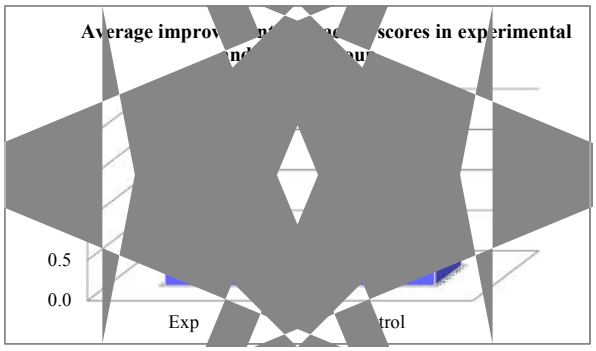

Figure 6b Shows the average improvement in practice scores of Nurses in the Experimental group and Control group.

Section V: Association of the Knowledge and Practices regarding Ergonomics among nurses with their demographic variables

This assessment was done using Fisher's exact test. Summary of Fisher's exact test is tabulated below:

Table 6a Fisher's exact test results for association of knowledge and demography of nurses.

N=60

Sr. No.	Demographic variable		Knowledge			p-value
			Poor	Average	Good	
1	Age	Below 30 years	22	15	3	0.849
		31 – 40 years	12	6	0	
		41 – 50 years	1	0	0	
		51 – 60 years	1	0	0	
2	Gender	Female	26	12	2	0.538
		Male	10	9	1	
		Between 51 – 60 Kg	10	2	1	
		Between 61 – 70 Kg	11	11	0	
		Above 70 Kg	8	5	0	
3	Years of Experience	Between 1 – 9 Years	24	16	3	0.821
		Between 10 – 18 Years	11	5	0	
		Between 19 – 27 Years	1	0	0	
4	Educational Qualification	Degree in nursing	7	2	2	0.058
		Diploma in nursing	29	19	1	

Table 6b Fisher's exact test results for association of practices and demography of nurses.

N=60

Sr No	Demographic variable		Practices			p-value
			Negligible risk	Low risk	Medium risk	
1	Age	Below 30 years	4	6	30	0.113
		31 – 40 years	0	7	11	
		41 – 50 years	0	1	0	
		51 – 60 years	0	0	1	
2	Gender	Female	1	8	31	0.093
		Male	3	6	11	
		Between 51 – 60 Kg	0	3	10	
		Between 61 – 70 Kg	2	5	15	
		Above 70 Kg	1	6	6	
3	Years of Experience	Between 1 – 9 Years	4	8	31	0.395
		Between 10 – 18 Years	0	6	10	
		Between 19 – 27	0	0	1	
4	Educational Qualification	Degree in nursing	3	1	7	0.022
		Diploma in nursing	1	13	35	

The above Table 6a shows that all the p-values are greater in value (more than 0.05) therefore, none of the demographic variables show a significant association with knowledge on ergonomics by the nurses working in operation theatre.

Since the p-value corresponding to educational qualification was small (less than 0.05), the null hypothesis is rejected. Demographic variable of educational qualification was found to have significant association with the practices of the nurses working in operation theatre regarding ergonomics.

RESULTS

The analysis made in the present study revealed that the pre knowledge and practices related to ergonomics in the studied samples were poor and the planned teaching given by the investigator on ergonomics in the operation theatre was very effective. It contributed to a significant increase in the post test knowledge and practices related to ergonomics in the operation theatre. Thereby, enabling to accept H_1 – i.e. there is a significant increase in the level of knowledge and practice after giving the structured teaching program on ergonomics to selected nurses working in the operation theatre.

The study was organized and following outcomes were observed-

1. The knowledge regarding ergonomics among nurses working in the operation theatre in pretest experimental group was that 70% of the nurses having poor knowledge, 26.7% of them had average knowledge and 3.3% of them had good knowledge.
2. Practices of ergonomics showed that 63.3% of the nurses working in the operation theatre had medium risk, 33.3% of them had low risk and 3.3% of them had negligible risk of developing musculoskeltal disorder by following poor ergonomics.
3. In experimental group, the post test showed 56.7% of them had good knowledge, 33.3% of them had average knowledge and 10% of them had poor knowledge regarding ergonomics which revealed that average knowledge score in pretest was 6.6 which increased to 14.1 in posttest.
4. Observation of pretest experimental group showed that 63.3% of the nurses had medium risk, 33.3% of them had low risk and 3.3% of them had negligible risk. In posttest, 43.3% of the nurses working in the operation theatre had negligible risk, 43.3% of them had low risk and 13.3% of them had medium risk regarding ergonomics which revealed that average practices score in pretest was 3.5 which decreased to 1.9 in posttest.

It can therefore be concluded that structured teaching program on ergonomics was found to be significantly effective in improving the knowledge and practices on ergonomics among the nurses working in operation theatre.

DISCUSSION

An Ergonomic Posture Analysis of Operation Theatre Employees is done by Aswathy P Sajeev, Government Engineering College, Kerala using Cornell Musculoskeletal tool to (i) determine the work (posture) of this particular group of health care workers and the effect of static posture (ii) identify activities involving poor work postures, and (iii) determine differences between specialties in regar posture stress load (iv) recommend better work posture solutions basic activities and can be used as a starting point from which to improve work conditions in order to reduce or eliminate physical complaints among operating room staff. A] The variation among specialities is studied by comparing the results of Cornell Musculoskeletal Questionnaire answered by various speciality surgeons. The variation was observed in body parts where discomfort was seen with respect to different specialities. B] The REBA analysis revealed that the cardiologists and ortho surgeons had majority of critical postures involved and the critical postures were subjected to evaluation through jack to understand the degree up to which there was discomfort. The observation period (2-3 hours) surgery and also the number of surgeries observed is not sufficient to describe the ergonomic situation for each subject individually. Several studies have reported high physical stress in general nurses.[5]

It is clear from the research reviewed that improper ergonomics practiced by nurses in the operation theatre have developed poor knowledge and practice. Research on teaching method gives very little definitive data regarding the effectiveness and implications. Along with this, it is also clear that the field of education and teaching still lacks positive emphasis for nursing students, staff nurses and nursing administrators to practice safe ergonomics.

CONCLUSION

After the detailed analysis, this study reads to the following conclusions:

1. Operation theatre nurses are not practicing correct ergonomics principles; they require further training and teaching regarding the knowledge and practice of ergonomics.
2. There is a significant increase in the knowledge and practice of selected operation theatre nurses after the structured teaching program.
3. There is an association between practice and educational qualification of nurses.

Hence, on the basis of the above findings, It can therefore be concluded that structured teaching program on ergonomics was found to be significantly effective in improving the knowledge and practices of nurses working in operation theatre.

Future Scope

The findings of the study have a definite implication to nursing practice, nursing education, nursing administration and nursing research.

In Nursing Practice

The study emphasizes on enhancement regarding knowledge and practice of ergonomics. Nurses must enhance their professional skills. All the nursing personnel's working in the hospitals must to improve practices by following the ergonomic principles rigorously. Periodic use of the Observation Checklist will help the nurses to minimize the risk of developing work related injury and it will help to evaluate their practices, improve the accuracy of skills while performing tasks, etc

In Nursing Education

Nursing students should be given an opportunity to learn about the knowledge and practice of ergonomics. Emphasis must be given towards the fundamental knowledge of the nursing process in order to understand its function for the nurses who will enhance the professional standards of nursing education. Addition of ergonomics in the syllabus or based on current laws, ordinances and guidelines must be introduced early in the prospects of nursing education.

In Nursing Administration

Nurses as an administrator play an important role in educating the professionals and help in policy making. In findings of the study revealed the need to conduct an on going education programme for the nurses who work in the operation theatre. The in-service education must include not just theoretical but also practical input. This will ensure better professional standards in nursing.

In Nursing Research

The result of the study contributes to the body of knowledge in nursing. There is need for extended and intensive nursing research in the area of clinical teaching of the staff nurses regarding ergonomics in the operation theatre to improve the knowledge and practices.

References

1. Goswami, S., Haldar, P. and Sahu, S. (2013). 1. An ergonomic study of postural stress of nurses working in orthopaedic wards. *International Journal of Occupational Safety and Health*, 3(1), pp.26 - 31.
2. L, W, (2010). Foundation of Nursing. 2nd ed Thomas Publications, pp.553 - 64.
3. Hartingsen J, Lauritzen S, Lings S, Lauritzen T. Intensive educational combined with low tech ergonomic intervention does not prevent low back pain in nurses. Occupational and Environmental Medicine 2005 Jan;62(1):13-7
4. ES. Ergonomics in nursing: The importance of a safe and healthy work environment [Internet]. Strategies for nurse managers. HCPro; [cited 2016Jan4]. Available from: http://www.hcpro.com/content /77607.pdf
5. *International Journal of Advanced Research Trends in Engineering and Technology* Vol. II, Special Issue X, March 2015, ISSN 2394-3777 (Print) ISSN 2394-3785 (Online) Available online at www.ijartet.com

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