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Effectiveness of Structured Teaching Programme on Knowledge and Practice regarding Body Mechanics for Prevention of Low Back Pain among Staff Nurses Working in Selected Hospitals of Kamrup Metro, Assam

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Abstract: ***Background**: Nurses have the highest prevalence of work-related musculoskeletal disorder with major complaint of low back pain. Sound knowledge and daily application of body mechanics paves the way for nurses to prevent low back pain. **Materials and Method**: A pre-experimental one group pre-test post-test research design was adopted to assess the effectiveness of structured teaching programme on knowledge and practice working in selected hospitals of Kamrup Metro, Assam. 100 staff nurses were selected using convenience sampling technique. Self-structured knowledge questionnaire and self-stated practice checklist was used to collect data. **Results**: The study revealed that mean difference of pre-test and post-test knowledge score was 6.97 and 't' value (16.78) was found statistically significant at (p<0.05) level of significance. Also for the practice score, mean difference between pre-test and post-test practice score was 2.78 and 't' value (11.17) was found statistically significant at (p<0.05) level of significance. The study revealed positive correlation between knowledge and practice of body mechanics (r = 0.258). The study also revealed significant association between pretest knowledge and practice with educational qualification and area of posting of staff nurses. **Conclusion**: The study showed that Structured Teaching Programme was effective in improving the knowledge and practice of staff nurses.*

Keywords: Effectiveness, Structured Teaching Programme, Body Mechanics, Knowledge, Practice, Staff Nurses

1. Introduction

"Take care of your body. It's the only place you have to live"
– Jim Rohn

Work-related musculoskeletal disorder (WMSD) is an emerging problem in today's society and second largest cause of short-term work-related disability putting the health care professionals at high risk for WMSDs. According to the World Health Organization's World Health Statistics Report, 2011, there are 19.3 million nurses and midwives which constitutes about 33% of the hospitals workforce and studies reveal that nurses have highest prevalence of WMSDs among all the health care professionals (HCPs) with major complaint of low back pain [1]

Nurses get exposed to low back injuries while providing patient care, as nursing care may contain strenuous physical effort such as patient transferring in and out of bed during daily care, carrying weights and working in a forced position. The most important psychosocial risk factors were attributed to the fast pace and emotional demands of the work. [2]The consequence of low back pain leads to functional disability, loss of work productivity and absenteeism. People who experience non-specific low back pain report impaired ability to perform daily activities. Dawson AP, Mc Lennan SN, Schiller SD, Jull GA, Hodges PW, et al. (2007) in a systematic review found that there is low level of evidence related to efficacy of workplace interventions in prevention of low back pain in nurses [3]

Body mechanics refers to the method of efficiently using the body when making movements, such as bending the body, lifting a heavy object or person, stretching an arm, sitting, standing, or lying while performing tasks (Kang Se-Won, 2017) [4] It can also be described as correct utilization of muscles to complete a task safely and efficiently, without undue strain on any muscle or joint. Understanding of proper body mechanics principles can be one reasonable way to prevent chronic back pain and to learn how to maintain correct ergonomics and vertebral posture during daily activities will lessen the threat posed during strenuous activities.

Continuous education and training are integral elements in improving nurse's performance and skills required for patient. In developed countries, significant improvements like ergonomics training for nurses about adequate body posture during nursing care and creating supportive work facilities have brought about changes to prevent low back pain. [9]Education in areas such as body mechanics and lifting techniques has proven to reduce the recurrence of musculoskeletal injuries in the work place. An increase in body mechanics knowledge not only can diminish the possibility of recurrence of injuries, but can also contribute to decreasing labor absenteeism, which can result in a cost-effective practice for organizations. [10]

2. Methodology

Research approach: Quantitative research approach

Research design: One group pretest post test design

Study setting: The study was conducted in two hospitals of Kamrup Metro, Assam
a) GNRC Hospital Dispur
b) NEMCARE Hospital Bhangagarh

Duration of the study: 1 month

Sample Size: 100 staff nurses

Sampling Technique: Non-probability convenient sampling technique

Development of tool:
Section A: Demographic Performa
Section B: Self-Structured Knowledge Questionnaire
Section C: Self-Stated Practice Checklist.

Data Collection Procedure:
- Formal permission was obtained from the concerned authorities of GNRC Hospital and NEMCARE Hospital Kamrup Metro Assam.
- Ethical permission and informed written consents was obtained from each respondent to conduct the study.
- On the first day pre-test was conducted by using self-structured knowledge questionnaire and self-stated practice checklist. On the same day, structured teaching programme on knowledge and practice regarding body mechanics for prevention of low back pain was given using lecture cum discussion and demonstration for the duration of 45 minutes.
- On the 8th day, post test was conducted by using the same self-structured knowledge questionnaire and self-stated practice checklist to assess the knowledge and practice regarding body mechanics for prevention of low back pain among staff nurses.

Plan for Data Analysis: Data collected was analyzed by using descriptive and inferential statistics based on the objectives of the study.
1) Descriptive statistics: Analysis was done by descriptive statistics such as frequency, percentage, mean, median, standard deviation.
2) Inferential Statistics: The effectiveness of structured teaching programme on knowledge and practice regarding body mechanics for prevention of low back pain among staff nurses was tested by using paired "t" test. The correlation between knowledge and practice regarding body mechanics for prevention of low back pain among staff nurses was tested using Karl Pearson's coefficient correlation. The association between knowledge and practice regarding body mechanics for prevention of low back pain among staff nurses was tested by $\chi 2$ test.

3. Results

Section I: **Findings related to demographic variables of staff nurses**

Table 1: Frequency and percentage distribution of staff nurses according to demographic variables, n=100

S. No	Demographic Variables	Groups	Frequency	Percentage
1.	Age	21-25years	35	35 %
		26-30years	24	24 %
		31-35years	22	22 %
		>36years	19	19 %
2.	Gender	Male	12	12 %
		Female	88	88 %
3.	Educational Qualification	GNM	69	69 %
		B. Sc, (N)	24	24 %
		P. B. Sc. (N)	6	6 %
		M. Sc (N)	1	1 %
4.	Clinical Experience	<1year	19	19 %
		1-5years	37	37 %
		6-10Years	13	13 %
		>10Years	31	31 %
5.	Area of Posting	Ward	28	28 %
		ICU	28	28 %
		OT	23	23 %
		A&E	21	21 %

The data in Table 1 shows that majority 35 (35%) of the staff nurses belong to the age group of 21-25 years. About the gender, majority 88 (88 %) of the staff nurses were female. Regarding the educational status, majority 69 (69 %) of the staff nurses had completed their educational qualification in GNM. In terms of clinical experience, majority 37 (37%) of the staff nurses had clinical experience of 1-5 years. In regard to area of posting, majority 28 (28 %) of the staff nurses were posted in Ward and ICU.

Section II: Findings related to Effectiveness of Structured Teaching Programme on Knowledge regarding Body Mechanics for Prevention of Low Back Pain among Staff Nurses.

Table 2: Frequency and percentage distribution of pre-test and post-test level of knowledge score regarding body mechanics for prevention of low back pain among staff nurses, n=100

S. no.	Level of knowledge	Score	Pre-test		Post-test	
			Frequency	Percentage	Frequency	Percentage
1	Inadequate knowledge	(0 – 15)	30	30%	-	-
2	Moderately adequate knowledge	(16 – 23)	53	53%	83	83%
3	Adequate knowledge	(24 – 30)	17	17%	17	17%

Data presented in Table 2 depicts the frequency and percentage distribution of level of knowledge regarding body mechanics for prevention of low back pain among staff nurses. Results revealed that in pre-test majority 53 (53%) of staff nurses had moderately adequate knowledge, followed by 30 (30%) with inadequate knowledge and 17 (17%) with adequate knowledge while in post-test majority 83 (83%) had moderately adequate knowledge and 17 (17 %) had

adequate knowledge. None of the staff nurses were found to have inadequate knowledge after administering structured teaching programme.

Table 3: Frequency and percentage distribution of pre-test and post-test level of practice score regarding body mechanics for prevention of low back pain among staff nurses, n=100

S. No.	Level of Practice	Score	Pre-test		Post-test	
			Frequency	Percentage	Frequency	Percentage
1	Poor	(0-5)	42	42%	-	-
2	Average	(6-8)	45	45%	14	14%
3	Good	(9-10)	13	13%	86	86%

Data in Table 3 depicts the frequency and percentage distribution of pre-test and post-test level of practice regarding body mechanics for prevention of low back pain among staff nurses. Results revealed that in pre-test majority 45 (45%) of staff nurses had average practice, followed by 42 (42%) with poor practice and 13 (13%) with good practice while in post-test majority of the staff nurses 86 (86 %) had good practice and 14 (14%) had average practice. None of the staff nurses were found to have poor practice.

Table 4: Effectiveness of Structured Teaching Programme on Knowledge regarding Body Mechanics for Prevention of Low Back Pain among Staff Nurses, n=100

Level of Knowledge	Mean	SD	Mean Difference	df	"t" value	Remark
Pre-test	19.13	4.75	6.97	99	16.78	S*
Post-test	26.10	3.00				

***p<0.05 level of significance S-Significant**

Data in Table 4 depicts that the calculated "t" value was 16.78 which was more than the tabulated value 1.98 (df=99) at p<0.05 level of significance. Hence the null hypothesis was rejected and research hypothesis was accepted which shows that structured teaching programme regarding body mechanics for prevention of low back pain was effective in improving the knowledge of staff nurses.

Table 5: Effectiveness of Structured Teaching Programme on Practice regarding Body Mechanics for Prevention of Low Back Pain among Staff Nurses, n=100

Level of Practice	Mean	SD	Mean Difference	df	"t" value	Remark
Pre-test	6.80	1.94	2.78	99	11.17	S*
Post-test	9.58	0.71				

***p<0.05 level of significance S-Significant**

Data in Table 5 depicts that the calculated "t" value was 11.17 which was more than the tabulated value 1.98 (df=99) at p<0.05 level of significance. Hence the null hypothesis was rejected and research hypothesis was accepted which shows that structured teaching programme regarding body mechanics for prevention of low back pain was effective in improving the practice of staff nurses.

Section III: Correlation between knowledge and practice regarding body mechanics for prevention of low back pain among staff nurses

Table 6: Correlation between pre-test level of knowledge and pre-test level of practice regarding body mechanics for prevention of low back pain among staff nurses, n=100

Pre – test Score	Mean	SD	r	Remark
Knowledge Score	19.13	4.75	0.272	Significance at p< 0.05 level of significance
Practice Score	6.80	1.94		

The data presented in Table 6 shows that there was weak positive correlation between pre-test knowledge score and pre-test practice, score (r = 0.272), which was statistically significant at p< 0.05 level of significance. Thus, research hypothesis was accepted and null hypothesis was rejected. Therefore, it can be inferred that there is positive correlation between knowledge and practice regarding body mechanics for prevention of low back pain among staff nurses.

Section IV Association between level of knowledge and level of practice regarding body mechanics for prevention of low back pain among staff nurses with selected demographic variables

Table 7: Association between level of knowledge regarding body mechanics for prevention of low back pain among staff nurses with selected demographic variables, n=100

Demographic Variables	Groups	Pre – Test Level of Knowledge			Total	χ^2 Value	df	Remarks
		Inadequate	Moderate	Adequate				
Age	21-25years	12	18	5	35	4.80	6	NS
	26-30years	4	15	5	24			
	31-35years	7	13	2	22			
	>36years	6	8	5	19			
Gender	Male	4	8	-	12	2.81	2	NS
	Female	25	46	17	88			
Educational Qualification	GNM	24	39	6	69	16.5	6	S*
	B. Sc, (N)	4	13	7	24			
	P. B. Sc. (N)	1	2	3	6			
	M. Sc (N)	-	-	1	1			
Clinical Experience	<1year	5	12	2	19	2.24	6	NS
	1-5years	10	19	8	37			
	6-10years	4	6	3	13			

	>10years	10	17	4	31			
Area of Posting	Ward	11	13	4	28	15.91	6	S*
	ICU	12	12	4	28			
	OT	2	19	2	23			
	A&E	4	10	7	21			

S-Significant *p<0.05 level of significance NS-Non Significant

The data presented in Table 7 shows that there was significant association between level of knowledge regarding body mechanics for prevention of low back pain with educational qualification (χ^2 = 16.5) and area of posting (χ^2 = 15.91) of staff nurses at p<0.05 level of significance but there was no association between level of knowledge regarding body mechanics for prevention of low back pain among staff nurses with the age, gender, and clinical experience of staff nurses. Hence, research hypothesis is accepted with regard to educational qualification and area of posting.

Table 8: Association between level of practice regarding body mechanics for prevention of low back pain among staff nurses with selected demographic variables, n=100

Demographic Variables	Groups	Pre – Test Level of Practice			Total	Chi Square	df	Remarks
		Poor	Average	Good				
Age	21-25years	15	16	4	35	2.25	6	NS
	26-30years	11	10	3	24			
	31-35years	10	11	1	22			
	>36years	6	10	3	19			
Gender	Male	4	6	2	12	0.66	2	NS
	Female	38	41	9	88			
Educational Qualification	GNM	27	33	9	69	13.47	6	S*
	B. Sc, (N)	14	7	3	24			
	P. B. Sc. (N)	1	5	-	6			
	M. Sc (N)	-	-	1	1			
Clinical Experience	<1year	10	7	2	19	5.26	6	NS
	1-5years	17	16	4	37			
	6-10Years	5	5	3	13			
	>10Years	10	19	2	31			
Area of Posting	Ward	12	10	6	28	13.52	6	S*
	ICU	15	13	-	28			
	OT	4	14	5	23			
	A&E	11	8	2	21			

S-Significant *p<0.05 level of significance NS – Non Significant

The data furnished in Table 8 shows that there was significant association between level of practice regarding body mechanics for prevention of low back pain with their educational qualification (χ^2 = 13.47) and area of posting (χ^2 = 13.52) at p<0.05 level of significance but there was no association between level of practice regarding body mechanics for prevention of low back pain among staff nurses with theage, gender, and clinical experience of staff nurses. Hence, research hypothesis is accepted with regard to educational qualification and area of posting.

4. Recommendations

Based on the findings of the study, the following recommendations are met:

- The study can be replicated on large number of samples in a different setting to have wider generalization of findings.
- A comparative study may be carried out to assess the knowledge on body mechanics on the sample drawn from different programmes in nursing and other health related professionals.
- A study can be conducted in an actual situation by observing the nurses performing selected procedures in the clinical situation.
- A follow up study can be done to determine the effectiveness of teaching programme in terms of practice of body mechanics in the daily activities.
- Similar study can be conducted and standardized protocols can be developed.
- A qualitative study can also be conducted with on a large sample.

5. Conclusion

From the findings of the present study, it can be concluded that structured teaching programme regarding body mechanics for prevention of low back pain was effective in increasing the knowledge and practice among the staff nurses.

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